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Railway Age

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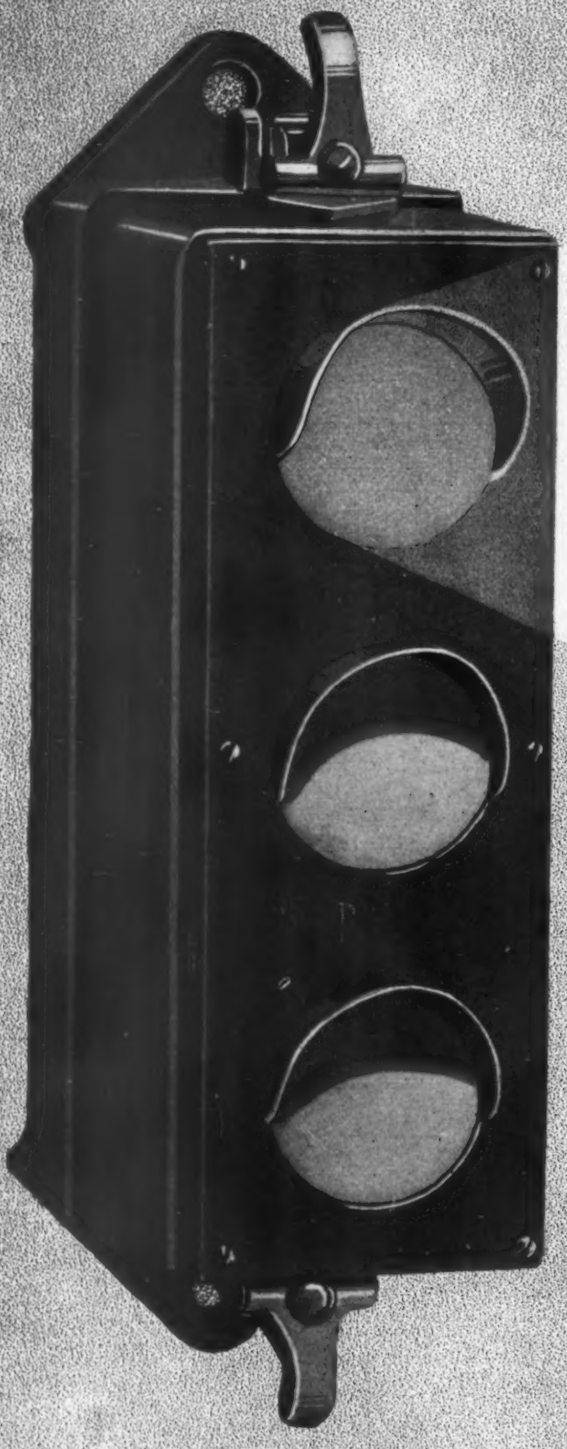

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Railway Age

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Labor Leaders and Railroad Employment

THE railways and their employees are suffering together from certain influences. The officers of the railway labor unions are elected and paid to further the interests of the employees belonging to their organizations, and they are failing to do certain things that are needed to protect the interests of the employees. Meantime they are starting a movement which, if successful, will in the long run be directly inimical to the railways and indirectly inimical to the employees.

In 1929, a year of record-breaking freight business, the railways had fewer employees than in any year since 1922, excepting 1928. In the first quarter of 1930 the railways employed an average of only 1,550,672 men. This was probably the smallest number they have employed in the first quarter of any year since 1909, and was 443,000 less than in the first quarter of 1920 and 242,500 less than in the first quarter of 1923. The leaders of the railway labor unions claim that many thousands of employees are the victims of "technological unemployment"—that is, of improvements in plants and operating methods which enable the railways to produce a given amount of transportation with a constantly declining number of employees. They are therefore starting a movement to force the railways to employ more men. The Railway Employees Department of the American Federation of Labor, at a recent meeting, adopted a "comprehensive program of stabilization of employment on the railroads." This would include the establishment of a 40 hour week consisting of five working days of eight hours, and such readjustment of hourly wages as would enable each employee to avoid any reduction of pay on account of the reduction in his hours of work. Statements emanating from leaders of other labor organizations indicate an intention to ask even larger reductions of working hours without any reduction of the compensation of individual employees.

If it were a fact that the decline of railroad employment during recent years has been due entirely or mainly to improvements in plants and operating methods, and consequent increase in the average output of transportation per employee, there might be some justification for a movement for reduction of working hours in order to maintain employment. But, as was conclusively shown in an editorial in the *Railway Age* of May 17, entitled "Decline of Railroad Employment," the principal cause of the decline within recent years in the number of railway employees has been a reduction of one-third in the passenger business of the railways and a reduction of about two-thirds in the annual increase of freight business. As was shown in that editorial, if railway traffic had increased as much in proportion within the last decade as it did during the preceding decade, and other things had been equal, the Class I railways would have needed about 2,385,000 employees in 1929, whereas the number was only 1,662,453. It may be conservatively estimated that if traffic had grown as rapidly during the last decade as it did during the two preceding decades the railways would now be employing 500,000 more men than they actually are.

Why Employment Has Declined

Passenger business has declined one-third because of the competition of motor vehicles operated on highways built and maintained at public expense. The annual growth of freight business has declined about two-thirds largely because of the competition of motor trucks operated on highways and boats operated on waterways built and maintained at public expense. The principal reason why the number of railway employees has declined instead of increasing has been the diversion of traffic to other means of transportation that are subsidized by taxes paid by the American public. What have the leaders of the railway labor organizations done during the last ten years to protect the jobs of railway employees from this subsidized competition?

In various parts of the country local unions have used their influence to get business men to ship by rail rather than by truck. In recent hearings before a Senate committee a number of employees of the Southern Pacific appeared in opposition to the Pittman Bill, which would render it impossible for the railways to make lower rates for longer than for shorter hauls to meet competition via the Panama canal, and thereby permanently divert traffic from them. Throughout the entire period, however, during which the government has been increasingly subsidizing competition with the railways, national leaders of the railway labor unions have kept practically silent regarding this policy. They are maintaining a profound silence now regarding the projects for the expenditure of hundreds of millions of dollars on the improvement of inland waterways for the purpose of di-

verting traffic from the railways. Their weekly paper, "Labor," constantly exaggerates railway earnings and publishes laudations of government ownership; it has even exaggerated the results being secured by the operation of the barge line in the Mississippi Valley, doubtless because it is owned by the government; but we have searched in vain through the columns of "Labor" for any expression of opposition to government policies which are resulting in the diversion of traffic from the railways and consequently in the loss of their jobs by thousands of railway employees.

We used to believe that the railway labor leaders were well-informed and able men who could readily adapt their policies to changing conditions. We begin to believe that we over-estimated them; that they are obsessed with the idea that the only way they can help their members is by forcing the railways to pay higher wages and employ more men than they need; and that they are entirely oblivious to the revolution in transportation conditions that is now occurring in this country. In the first quarter of 1930 the railways employed 5,065 less men than in the first quarter of 1922, but paid them $57,126,521 more in wages. A reduction of working hours would temporarily increase the number of employees, but, without a reduction in average pay, would cause a further large increase in total wages. The net operating income of the railways in both good and poor years is so small that this would necessitate an advance in freight rates. Under present conditions, with the government subsidizing competing means of transportation, an advance in railway rates probably would divert more traffic from the railways, and thereby renew the tendency for railway employment to decline. Would the labor leaders then demand another reduction of hours that would further increase railway expenses, and indirectly drive more traffic and employees from the railways?

Labor Leaders and Subsidized Competition

The railway labor leaders should begin to inform themselves as to the real conditions in the railroad business and the causes of those conditions. The amount of employment the railways can give depends upon the traffic they can get and the earnings they can make. The national leaders of the labor organizations are supposed to be given their positions and salaries to protect the employment as well as the wages of the members of the unions. Both before and since the war improvements in plants and operating methods have tended to reduce the number of employees, but prior to 1917 the increase in railway traffic constantly caused an increase in the number of railway employees, in spite of the improvements then constantly being made in plants and operating methods. On the other hand, since 1920, and especially since 1923, there has been such a decline in passenger traffic and such a small increase in freight business that the increase in traffic has failed to offset the effect of the improvements made in plants and operating methods, and there has been a steady decline in the number of railway employees. The competition of other means of transportation has been so effective mainly because they have been subsidized by the government. Under intelligent and courageous leadership the employees of the railways could have exerted a powerful influence against this subsidization of other means of transportation. Under such leadership they could exert a powerful influence against it in future. The progress of the movement for extensive development of inland waterways would be greatly retarded if organized railway employees, through their labor leaders, should notify all members of Congress that this is a subject that concerns them, and that they propose to vote against candidates who favor waterway development for which there is no economic justification and which tends to deprive railway employees of their jobs. Apparently, however, the present labor leaders are so obsessed with the idea that their sole function is to force increased costs on the railways that they cannot study the real causes of the decline in railroad employment and help adopt measures to stop it by removing its causes.

Fuel Efficiency Still Gains

IN these days of low railway traffic, lower railway earnings and lowest rate of railway return (since 1921) it is refreshing to find some bright spots in the present railway situation. One of the brightest of such spots is the increasing efficiency still being shown by the railways in their locomotive fuel consumption.

According to recent figures of the Interstate Commerce Commission covering the first quarter of the present year the railways in their freight service burned 134 lb. of coal for every thousand tons of freight and equipment moved one mile. This is the lowest figure ever reported for a comparable period. In the first quarter of 1929, corresponding fuel consumption was 139 lb. of coal, and in the first quarter of 1923, 186 lb. The 1930 average thus represents a saving of 28 per cent under the 1923 mark.

In passenger service it required in the first three months of 1930 16.0 lb. of coal to move a passenger train car for a distance of one mile. This figure also, as in the freight service, represents a new low record. The corresponding fuel consumption in 1929 was 16.4 lb., and in 1923, 20.7 lb. Nineteen thirty thus shows a unit fuel saving in passenger service of more than 20 per cent under 1923.

Based on the actual traffic handled in the first quarter of 1930 this increased efficiency since 1923 in the use of locomotive fuel resulted in a total saving in these three months of 9,612,453 tons of coal. Passenger service was responsible for 2,200,841 tons, and freight service for 7,411,612 tons of this total.

At the average prices paid for railway coal this increased efficiency in fuel use resulted in a saving under the 1923 average fuel consumption amounting to $22,589,000 or roughly, 15 per cent of the railways' net

earnings for the first quarter of the year. In other words, almost one-sixth of railway net earnings in the first three months of 1930 was due to the increase made since 1923 in the efficiency with which coal is burned in railway locomotives.

Elimination—Crossings or Careless Motorists?

AMONG the many conditions which endanger the public safety, the railway-highway crossing problem has caught the popular attention and created an insistent clamor for immediate action to eradicate the evil. This outpouring of public opinion usually takes the form of local governmental insistence on the construction of grade separation structures at particular points. If public attention is attracted to a crossing by a fatal accident, the demand is that much more insistent for grade separation, and that much more directed toward the railroad involved.

Characteristically, public opinion is apt to make the most obvious cause of an accident—the grade crossing—the subject of its attack, practically ignoring its own carelessness—for the public and the motorists are synonymous these days—in the matter. As Charles W. Galloway pointed out in an address appearing elsewhere in this issue, the elimination of all the existing grade crossings in the United States would require a prohibitive expenditure, approximately equal to the total present investment in railway property. But it is doubtful if the complete elimination of present grade crossings would solve the difficulty. In spite of a helpful spirit on the part of many of the state railroad commissions, which refuse to sanction wholesale applications of municipalities to create new crossings over railway tracks at grade, their number continues to increase. Nor has the tendency of motorists to run into the sides of standing or moving trains shown any appreciable diminution.

The ideal, and fool-proof, course of action would consist of protecting the motorist against himself, by making it physically impossible for him to come in contact with railway rolling stock. But since that course appears to be impracticable, it would seem that the second-best method of procedure would be the elimination of the worst grade crossings, accompanied, as Mr. Galloway suggests, by the elimination of those autoists who make fool-proof measures necessary.

Up to the present time, the most effective means of depriving the careless driver of the right to the use of the highway has been the enactment of laws requiring the licensing of operators of motor vehicles. In several states which recently started the licensing of motorists, the decrease in railway-highway grade crossing accidents was so immediate and so substantial that it is a proper question whether such control of the public would not in time constitute practically a complete solution. While publicity campaigns urging caution at crossings have undoubtedly had a good effect, they have been little more than a small voice shouting against the roar of a crowd. Has not the time arrived when the state governments should take some more drastic action? Enactment and proper enforcement of licensing laws in the thirty-odd states that do not now have such statutes, should appreciably decrease the waste of human life at crossings and at the same time obviate enormous expenditures for grade separation structures on the part of both the public and the railways, for which the public must pay, in the end.

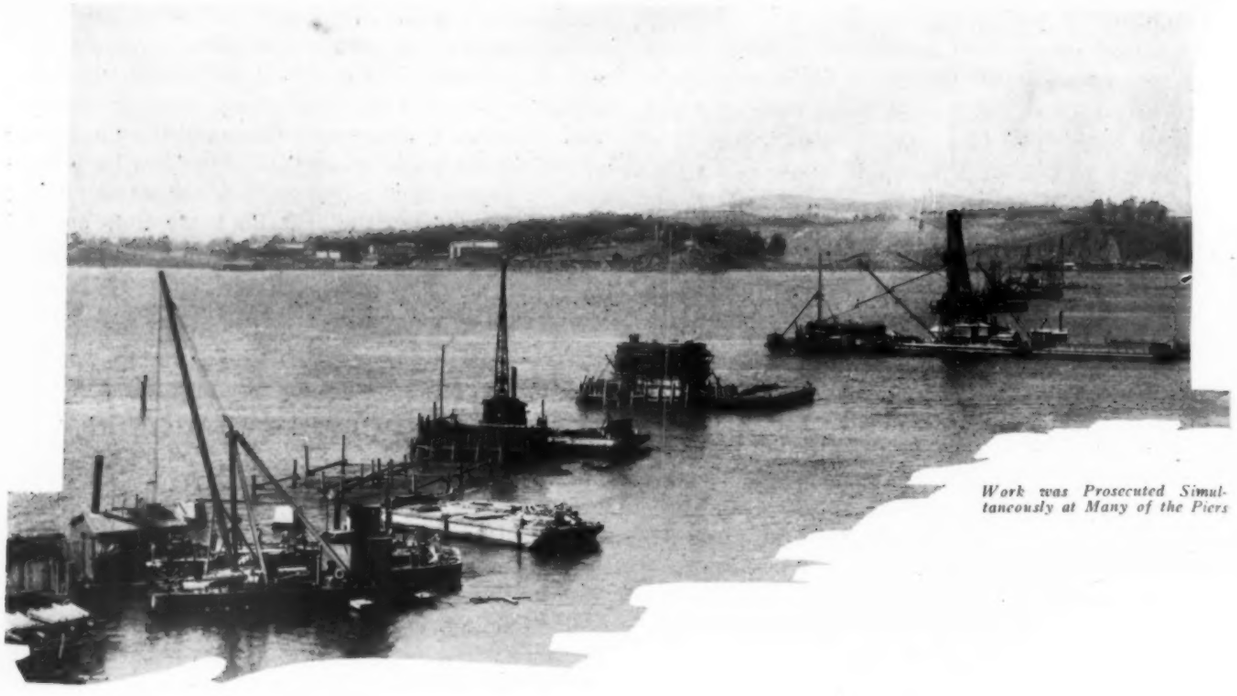
Should Concrete Roadbeds Be Given Further Trial?

NOT long ago the manufacturer of a new railway appliance was asked why he confined his sales efforts to executive officers to the exclusion of the officers of the technical department under whose jurisdiction the appliance would naturally fall. His answer was that his product was so expensive and represented such a drastic departure from accepted practice that no railway officer short of the president would dare to risk his reputation on a trial installation of sufficient scope to demonstrate the economies claimed for it.

Is this not the present status of concrete roadbed of the type developed on the Pere Marquette? After more than three years' service, this installation has disclosed no evidence of progressive deterioration and has manifested no basic defects that are not capable of correction through improvements in the design of details. However, as shown in the paper by Paul Chipman, abstracted in the *Railway Age* of May 31, an installation constructed on a quantity basis will represent an added investment of from $12,000 to $20,000 per mile. Moreover, the economies to be realized from such track construction are still necessarily speculative and will remain so until the concrete roadbed has been subjected to use on a broader scale.

Officers in charge of track maintenance have manifested keen interest in the Pere Marquette track and many of them have gone to Beech, Mich., to inspect it, but, as far as we know, none has recommended an installation on his own road. This is only natural. The necessary expenditure must be recommended without full assurance of savings commensurate with the interest on the investment. It must be submitted purely as an experiment.

Yet, in spite of this, are not further trials of the concrete roadbed justified? Granting that its advantages are problematical, is it not a fact that there are lines subjected to such heavy traffic that the expense of the replacement of ties, of resurfacing and of ballast cleaning points emphatically to the limitations of the present standards of track construction under such conditions? Here is a case, it would seem, where initiative must come from the management rather than from the head of the technical department.



Work was Prosecuted Simultaneously at Many of the Piers

Novel Construction Methods Used On Suisun Bay Bridge

Great structure replaces historic ferry service on Southern Pacific line into San Francisco

By William H. Kirkbride

Engineer Maintenance of Way and Structures,
Southern Pacific Company

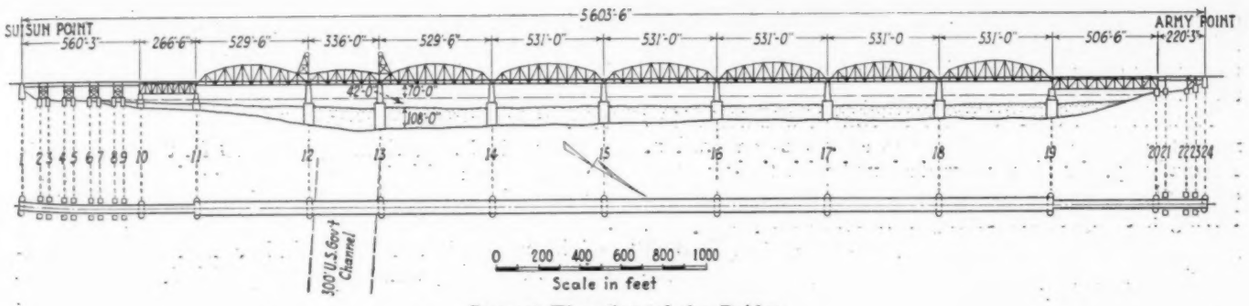
[The following is an abstract of a paper presented before the spring meeting of the American Society of Civil Engineers at Sacramento, Cal., on April 24. It deals with the construction of a bridge that imposed many problems of an unusual nature, and describes foundation methods that are distinctly out of the ordinary. It is prefaced, also, by some interesting details of the early history of that portion of the Central Pacific between San Francisco and Sacramento. EDITOR.]

THE first railroads in California were constructed out of Sacramento, the first line extending from Sacramento to Folsom, followed by the completion, in May, 1869, of the famous Central Pacific that formed the western leg of the first transcontinental railroad.

During the construction of the Central Pacific, a line of railroad was built in 1868 from South Vallejo to Sacramento, via Suisun, passing over a spur of the Coast range with a summit elevation of 315 ft. above sea level. In connection with this railroad, a steamer line was operated from South Vallejo to San Francisco.

There next followed, in 1869, the construction of a railroad from Sacramento to Oakland, via Tracy, which passed over the Altamont summit of the Coast range at Elevation 740 above sea level. The railroad from Oakland to Martinez, along the southerly shore of San Francisco bay and the Carquinez straits, was placed in operation in January, 1878, and in the latter part of that month was extended to Tracy. Thereafter, the steamer line to San Francisco was discontinued and a ferry was established across the Carquinez straits, connecting South Vallejo with the Tracy-Oakland line. Later, in December, 1879, a more direct low-level route between San Francisco and Sacramento being desired, the railroad passing through Suisun was projected directly across the marsh and peat lands on the north shore of Suisun bay to Benicia.

A bridge across the Carquinez straits or Suisun bay was considered but was not economically feasible, and in its place a train-ferry service was established to transport passenger and freight trains to a connection



General Elevation of the Bridge

with the railroad on the south shore, previously referred to as the Tracy-Oakland line. This was accomplished by the construction of docks and slips at Port Costa and Benicia, and the building of the steamer "Solano," which is still in service after 50 years.

It is interesting to note that this boat was designed and constructed by Arthur Brown, superintendent of the bridge and building department of the old Central Pacific, a man of remarkable genius and energy. He made use of the principle of a truss bridge in designing the hull, which is stiffened by four timber Howe trusses. In 1879 trains were small and rolling equipment light, but notwithstanding this fact the "Solano" is still the largest car ferry in the world. In 1914, as part of a second-track program, double-track slips were constructed and a second car ferry, the "Contra Costa," was put into commission.

The bridging of the bay or straits had long been considered. Sundry locations were investigated, including a crossing upstream from the Army Point-Suisun Point alinement, several in the vicinity of Benicia and Port Costa and others as far west as Vallejo Junction. However, all plans were rejected because of the difficulties imposed. Finally in 1927, because of the growth of traffic, coupled with the fact that the company faced the necessity of replacing the two existing car ferries and the buying of a third, the building of a bridge became an economic necessity.

The existence of two solid rocky points of land—one known as Army Point on the north shore of Suisun bay, two miles east of Benicia, and the other as Suisun or Bulls' Head Point near Martinez and adjacent to the tracks of the Tracy-Oakland line, offered the necessary support for the approaches and abutments, and permitted effective solution of the problem of connecting lines. The government maintains a navigable channel 300 ft. wide for deep-draft vessels near the Martinez shore, but small craft, including fishing boats, use the entire width of the bay.

Diamond-drill borings put down across the bay on the proposed alinement of the bridge showed that bedrock consisted of alternate strata of shale and sandstone at a dip ranging from 60 to 70 deg. from the horizontal. The depth below low water to bedrock ranges from 115 ft. near Army Point to 136 ft. near Suisun Point, at the government channel. From these depths the rock surface slopes rapidly upward to the shore line on both sides.

The nature of the mud and gravel overlying the rock was also studied, but from the bearing values determined for this material, it was concluded that the bridge piers must be carried to and founded on the bedrock. The depth of mud near Army Point is 59 ft., while the greatest depth of 101 ft. is near Pier 13; the greatest depth of water is 72 ft., on the Army Point side.

Located in a Fault Zone

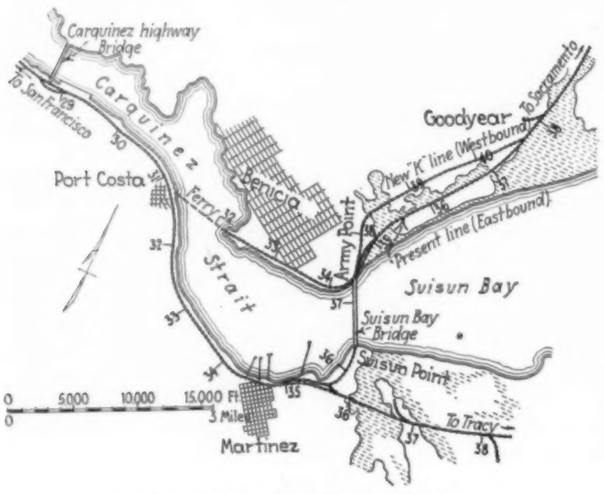
Geologists retained to study the bridge site reported the existence of two well-established major faults extending parallel to each other in a northwesterly and southeasterly direction. In the Martinez hills there are various fault lines in directions angular to the major faults, and the direction of one of these fault lines was such as to present the question—Did it pass under the bridge? The bay sediments hid its true direction.

While they expressed some differences of opinion, the geologists agreed that the fault was not active and that any future movement of adjacent blocks along this fault line would be nominal. However, for various reasons, it was decided to put down additional diamond-drill holes, and a study of these core drillings, as well as the core drillings of all other diamond-drill holes, led to the

Floating Out Span 19 After It Had Been Used as Falsework Under Span 11

conclusion that the fault did not extend across the bridge location and that the bridge foundations would rest solely on one monolithic block of geological formation, namely the Chico-Cretaceous.

However, for other obvious reasons it was decided to make the bridge piers resistant to earthquake vibration. Accordingly, the piers were designed with their centers of gravity as low as possible and were built of concrete having a compressive strength of 2,500 lb. per sq. in.,



Map of the Suisun Bay Crossing

and a tensile strength of 400 lb. at the end of 28 days; with 30 lb. of steel reinforcement per cubic yard, so placed as to withstand earthquake shocks of an acceleration of 5 ft. per sec. per sec., which is twice the intensity of the San Francisco earthquake of 1906, and 1.5 times the intensity of the Tokyo (Japan) earthquake of 1923.

The superstructure was designed to resist similar shocks and the tops of piers were widened and the bases of the steel bridge shoes were notched into the concrete to prevent the spans being pulled off the piers. In designing a pier structure of this kind to resist earthquake vibrations, a quick reduction from a large mass to a smaller mass is a source of weakness; likewise a construction joint is undesirable—monolithic construction is essential.. To meet this requirement, as between the caisson and pier shaft, and to overcome the difference of inertia of the two masses, reinforcing rods extend upward from the outer walls of the caisson, pass through the distributing block and curve inward and upward into the pier shaft.

The Substructure

The substructure consists of 2 "U" abutments, 8 viaduct pedestal piers on land and 14 viaduct pedestal piers and 10 truss-span piers in water. Eight of the truss span piers are classed as deep-water piers, as the rock bottom upon which they are founded is from 115 to 134 ft. below low water level.

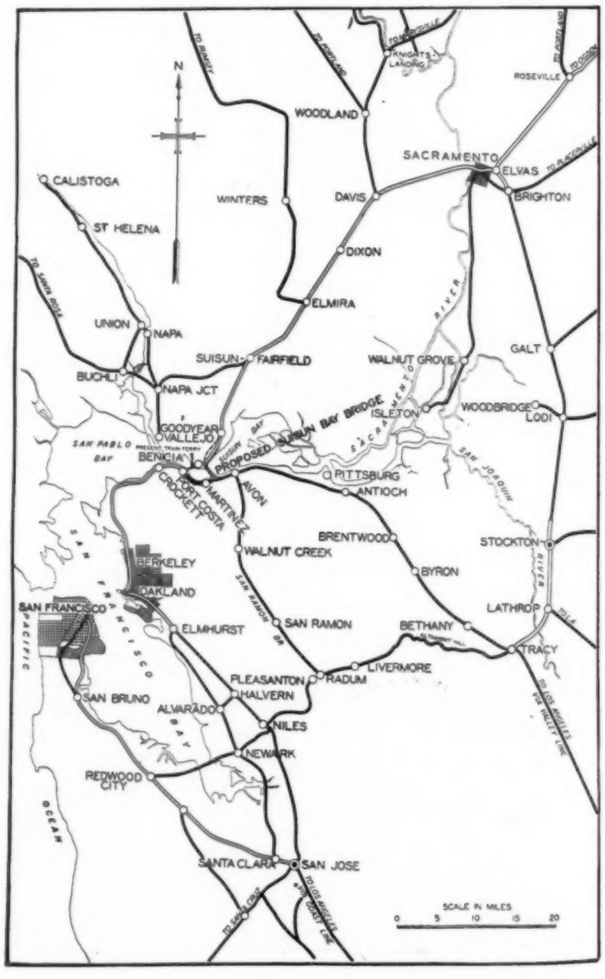
Pier 11, one of the shallow-water type, has a footing or base 38 ft. by 60 ft. in cross-section, and an oval-shaped shaft that tapers with a side batter of 1 in 24 to a coping 16 ft. wide by 49 ft. long. The depth below datum is 51 ft. and the total height of the pier above rock foundation is 89.5 ft. It was constructed within a rectangular-shaped steel sheet-pile cofferdam. Pier No. 10 is similar in design except that it is founded on bedrock 21 ft. below datum.

Pier No. 13 is the deepest of the deep water piers. The pier shaft rises to Elevation 71.5. It is rectangular in section, the coping being 17 ft. wide by 49 ft. long. The shaft extends down with a side batter of 1 in 24 to Elevation 20 below water, where it rests on and is integral with the distributing block 10 ft. thick, which in turn rests on and is integral with the caisson. The latter extends to bedrock at Elevation –134.1. The total height of this pier is 203.6 ft.

The caisson is 40 ft. by 60 ft. in cross-section and contains 6 dredging wells, 10.5 ft. by 11.7 ft. in cross-section; the exterior walls are 5.5 ft. thick and the partition walls 6 ft. in thickness. The bottom of the caisson has a structural steel cutting edge, but the interior partition struts, conforming to the walls of the six dredging wells, are blunt on the lower surface to lend stability to the caisson during sinking operations and to distribute foundation reactions better.

The total volume of concrete in this structure is 12,283 cu. yd. The total weight of structural and reinforcing steel is 444,520 lb. Except for the dredging wells, the caisson distributing block and pier shaft are of reinforced concrete, the dredging wells being filled with tremie concrete.

Pier No. 12 is identical in design except as to its height, being founded on rock at Elevation –105.5, with a total height of 177 ft. These two piers support the lift span and towers and the adjacent spans; the other deep-water piers are similar in design except that



General Location Map

the caisson dimensions are 30 ft. by 60 ft., the dimensions on top of the coping 16 ft. by 49 ft., and the bridge seat at Elevation –73.5.

Novel Foundation Methods

The construction of that portion of the substructure on land followed the usual method of excavating to suitable rock foundation, and the viaduct pedestals in water, having a maximum submergence of not to exceed 13 ft., were constructed by driving cofferdams of Wakefield sheet piling. Piers 10 and 11 were constructed within open cofferdams of interlocking steel piles 65 ft. in length, which were driven inside a timber falsework of piling on 7 ft. centers, batter brace piles also being used with 2 rows of 12-in. by 12-in. timber wales bolted to the piles. Only a single row of sheet piling was used for Pier 11, the inside bracing consisting of a crib or grillage formed of 12-in. by 12-in. struts and posts, and 12-in. by 24-in. wales, tied together by a 3-in. by 10-in. diagonal bracing and all securely bolted together.

The grillage was sunk almost to bedrock by being loaded with about 270 tons of steel rails. Mud and clay were dredged out by a clamshell bucket operated from a floating derrick barge. Water was removed by pumping. Pier 10 was similarly constructed, i.e. using sheet piling and timber removed from the cofferdam for Pier 11.

The construction of the deep-water piers presented a difficult problem. As the depth of water precluded the use of either the open cofferdam or pneumatic method, it was proposed to sink caissons by the open-well dredging method. However, the great depth of the water, a maximum tidal fluctuation of about ten feet, the swiftness of the current during the winter floods and at rip tide, and the softness of the underlying bay deposits, made the launching and sinking of a timber crib difficult. To meet this problem, the contractors, Siems, Helmers & Schaffner of St. Paul, Minn., to whom the foundation contract was awarded, proposed a unique method of sinking these deep-water caissons which is being carried out with great success.

The first step in this process involves the driving of piles to support an octagonal-shaped platform, which serves as the base for a tower consisting of eight steel gallows frames. This is equipped with winches from which cables pass over sheave-wheels set at the top. By means of this apparatus, a steel shell, that might be likened to a bottomless oil tank 81 ft. in diameter, is erected and lowered through the water into the mud, which it penetrates to a depth of 15 to 30 ft., depending on the compactness of the material.

This shell is built up of circular sections 10 ft. in height, which are bolted together, permitting of later removal except for that portion in the mud. The steel shell extends above high water and is filled in with suitable sand dredged from up the river.

An Artificial Island

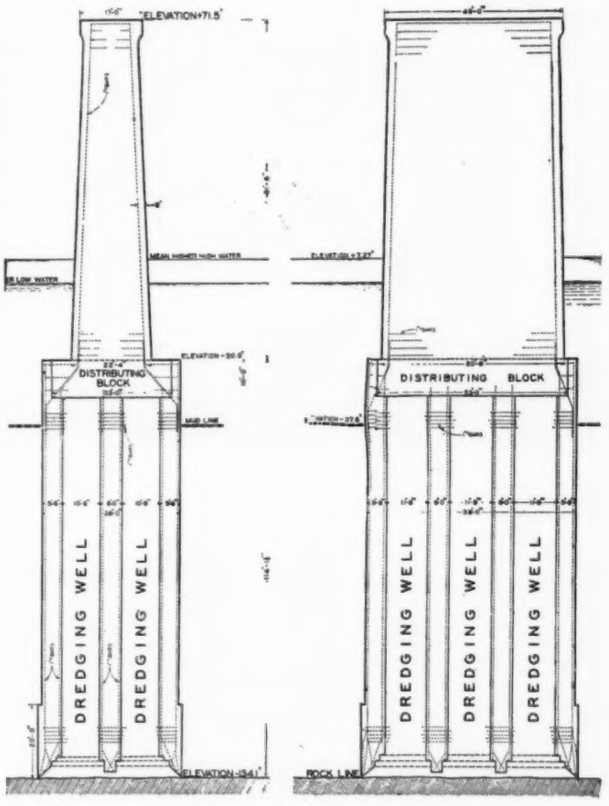
The artificial island thus created permits the accurate staking out and fabrication of the steel cutting edge of the caisson that is to be sunk to rock. After forms are erected, the reinforcing steel is placed and the concrete poured in successive lifts of 10 ft. As all of the work is done above water, it is possible to construct the caisson of reinforced concrete of the desired quality and strength, and exact centering and orientation are assured.

Upon the completion of the first 20 ft. of concrete shell, removal of sand from the six dredging wells is commenced by means of clamshell excavators operated from floating derrick barges. The caisson gradually settles into the sand deposit and the underlying strata as the excavation from the dredging wells continues.

At the time of starting the concrete caisson, four well holes are put down within the steel shell, by means of which the exact elevation of the bedrock is determined at four points, conforming to the four sides of the caisson. This information determines the proper height of the caisson prior to sinking and the elevation at which to commence the construction of a timber cofferdam that extends from Elevation –20 to well above high water.

This cofferdam, constructed of 12-in. by 12-in. timbers, drift-bolted and properly caulked, is removable, being supported on the concrete caisson and connected to it by suitable tie-bars. The use of the cofferdam permits the pouring of the distributing block and the erection of the pier shaft from a depth 30 ft. below high water and thereby effects a saving in the amount of the concrete by the reduction from the large section of the caisson to the smaller section of the pier shaft, and creates a temporary bridge seat or shelf that is used to support the steel bents of a falsework bridge span, as described later.

Upon landing the caisson at or near bedrock, and after the greater part of the material immediately above



Sections of a Typical Deep-Water Pier

bedrock has been removed by hydraulic jetting and clamshell excavation, a deep-water diver explores the bottom thoroughly, telephoning the conditions existing within and under the caisson. He notes particularly the relation of the cutting edge to bedrock, and the amount of excavation still to be done. In all cases considerable clay or gravel, as the case may be, has been found compacted under the partition walls and banked up against the cutting edge, but with the in-

formation thus furnished, the contractor is enabled to direct his jetting operations so that the foundation area is found in a clean condition upon subsequent examination.

Diver Examination at an Extreme Depth

The diver has been able to render accurate information as to the penetration of the cutting edge into the foundation rock and in each case brings up samples of the rock encountered. We believe this is the first time a deep-sea diver has been used at such great depth of water in open-caisson work. It has enabled the railway engineers to verify the diamond-drill borings, to know definitely the nature of the bedrock formation and to be assured that the bridge piers are actually resting directly upon the rock; that full bearing has been secured and that an interlocked connection has been established between the steel cutting edge and bedrock.

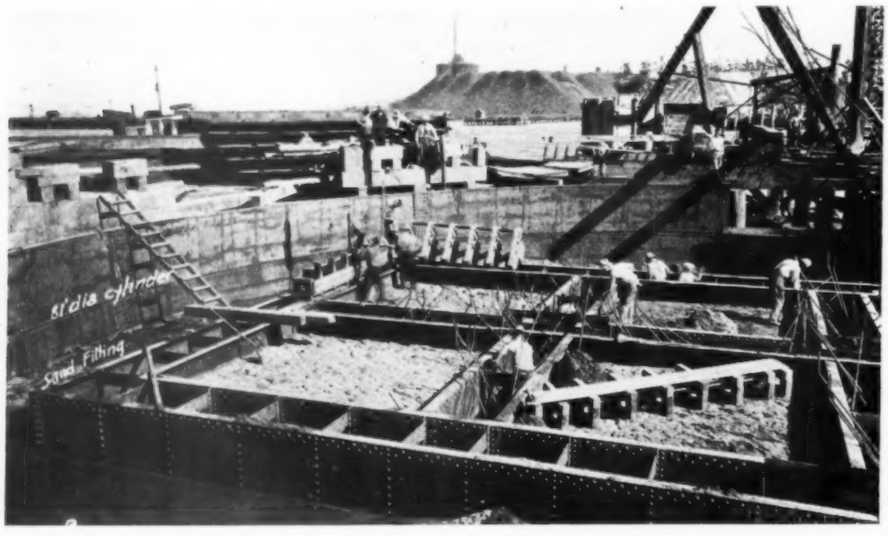
Thereafter, the foundation is sealed by depositing concrete through the water in the dredging wells. This operation consists in the lowering of a 12-in. tremie pipe, which may be as much as 150 ft. long. The depositing of concrete is continued without interruption

clination from the vertical. For instance, the caisson of the deepest pier, No. 13, deviates from true orientation by a southerly departure of 0.73 ft. and an easterly departure of 0.89 ft., the inclination from the vertical being 0.75 ft. in a height of 113 ft. or equal to a batter of 1 in 150. Of course, even this slight error is corrected, as forms of the pier shaft are set to instrumental exactness.

At times, when dredging to what was deemed a maximum allowable depth below the cutting edge did not produce the desired rate of settlement of the caisson, the setting off of small charges of dynamite in the bottoms of the dredging wells accelerated the movement.

The Superstructure

The bridge is 5,603.5 ft. long between abutments, and accommodates two tracks spaced 13 ft. center to center. The elevation of the base of rail is 85.6 ft. above railroad datum which provides a vertical clearance above mean higher high water of 70 ft. for the entire navigable distance of 4,050 ft. across the bay. But provision is being made for a 328-ft. vertical lift span that will, when raised, clear mean higher high water by 135 ft.



Laying the Cutting Edge for a Caisson

until a dredging well has been sealed to the desired height, the six wells being filled in succession.

In the start, the tremie concrete was brought up to an elevation 30 ft. above bedrock, after which the caisson was unwatered, disclosing about 1½ ft. of the mud and laitance on top of the tremie concrete. This was removed, and samples broken out of the tremie concrete were found to be of an excellent quality. Being thus assured of the results obtained, the contractor was permitted to bring the tremie concrete up about to the elevation of the distributing block in one pouring.

The next step is to pour the distributing block—a large mass of reinforced concrete 10 ft. thick, 50 ft. long and 33 ft. wide, after which the pier is completed by the pouring of the pier shaft to bridge-seat elevation in 10-ft. lifts, using wooden forms held in position by being bolted to the concrete section immediately below the one being poured. Much of the material used in the octagonal falsework, steel shell and timber cofferdam is being reused from pier to pier as construction proceeds.

The construction methods have been highly successful. The piers have landed on bedrock in all cases with but slight variation from the true center or in-

These clearances are increased by 6.5 ft. when tide is at mean lower low water.

The bridge is on tangent except that spiraled 4-deg. curves at each end extend out on the viaduct portions. A length of 4,556.5 ft. of the bridge is on level grade, there being viaduct approach grades of 0.45 per cent on the north and 0.62 per cent on the south end.

The superstructure consists of seven through truss spans of 526 ft., one vertical lift span 328 ft. long; one deck span of 504 ft., a deck span 264 ft. in length and two viaduct approaches of the usual design, consisting on the south end of five 80-ft. clear spans and four 40-ft. tower spans, and on the north end of one 40-ft. and one 100-ft. clear span and two 40-ft. tower spans.

The truss spans are all of the Warren type. Balancing cost of superstructure against cost of substructure, the economical span length for this crossing would be somewhere between 400 and 425 ft., but navigation interests are better served by a span length of 526 ft., primarily because it permits the passage of long barge tows without danger of side-swiping the piers; and after conference with the engineers of the War Department and navigation interests that length was agreed upon. Towers for raising the lift span are integral with the spans adjacent

to the lift span and rise to a vertical height of 139 ft. above the bridge seat.

Heavier Loading and Higher Stresses

The superstructure is designed for a train loading equivalent to Cooper's E-90 locomotives followed and preceded by a uniform load 7,500 lb. per track foot, (with the unit stresses given below). The uniform load is omitted or used at both or either ends of the concentrated system.

Silicon steel is used for the principal members fabricated from shapes and carbon steel for the remainder, except that the eye-bars in the lower chords will be heat-treated. The total weight of the structural steel is 44,000,000 lb., comprising 25,000,000 lb of silicon steel, 5,500,000 lb. of heat-treated eye-bars and 13,500,000 lb. of carbon steel.

The permissible unit stresses as used in the design are as follows: For axial tension in net section—

Carbon steel 21,300 lb. per sq. in.
Silicon steel, 32,000 lb. per sq. in.
Heat-treated eye-bars, 36,000 lb. per sq. in.

For axial compression in gross section—

$$\text{Carbon steel } 20{,}000 - 70\,\frac{l}{r} \text{ (up to 16,500 lb. per sq. in.)}$$

$$\text{Silicon steel } 30{,}000 - 105\,\frac{l}{r} \text{ (up to 24,750 lb. per sq. in.)}$$

A description of the 526 ft. span follows:

The trusses are spaced 33 ft. center to center, with the vertical distance between top and bottom chords varying from 45 ft. at the end posts to 80 ft. for the two center panels. The largest eye-bars in the lower chord are 14 in. wide by 1⅞ in. thick. The pins are 13 in. in diameter, with a maximum length of 3 ft. 4 in. The top chords and end posts are of the box section, 3 ft. 6 in. deep by 40 in. wide. The largest section of the top chord is made up of one top cover plate 40 in. by ¾ in., 2 top angles 6 in. by 6 in. by ¾ in., 4 webs 42 in. by ⅝ in., 2 webs 42 in. by 9/16 in. and 2 lower angles 8 in. by 8 in. by ¾ in.

The lift span, a riveted truss throughout, has a height of 45 ft. at the end posts, and 62 ft. for the two center panels. The make-up of members follows usual practice.

Use One Span for Falsework

The superstructure is being fabricated at the Ambridge (Pa.) plant of the American Bridge Company which also has the contract for the erection, working under subcontract with the United Steel Products Company. An economical and satisfactory falsework method is being used by the contractor to avoid the driving of piling under the main spans which is objectionable for many reasons.

The steel is being erected from the south or Martinez end, progressively working across the Bay to the Army Point end. Proceeding from the abutment, the 560-ft. viaduct was erected to Pier 10, except that the last pair of girders of the eastward track were used temporarily for a turnout approach to a falsework trestle that was driven immediately upstream from the span between Pier 10 and Pier 11 for use in the erection of the 504-ft. deck span for reasons given below.

To avoid duplicate falsework, the 260-ft. deck span was first erected on this falsework and then floated laterally into position on two 40-ft. by 125-ft. barges and brought to rest on Piers 10 and 11. After this, the 504-ft. deck span was erected on this falsework. This is to be placed eventually between Piers 19 and 20 at the Army Point end of the bridge but is being used at present in the erection of the eight through spans of the bridge. This is being accomplished in the following manner:

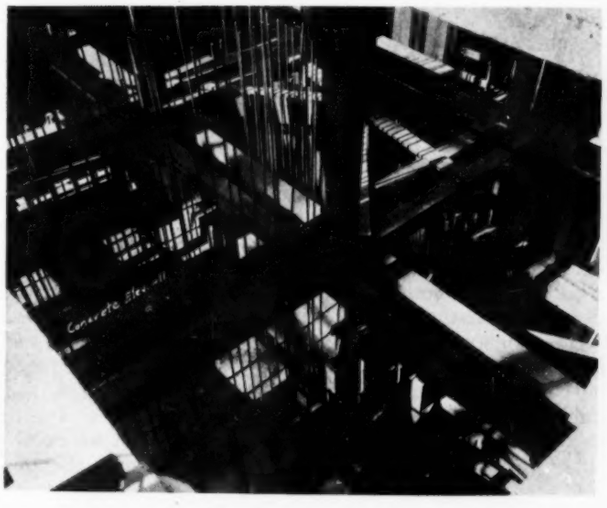
Eight 500-ton Jacks Were Used in Landing Span 10 on the Piers After It Had Been Floated Into Position

It is floated in turn between the piers of the through spans and brought to bearing on temporary steel bents that rest upon the shelves formed by the top of the caisson at Elevation — 20. These bents, which are secured to the pier shaft, are of such height that the falsework span has its top chords at an elevation permitting the laying of erecting tracks and the placing of the blocking upon which the permanent span is erected.

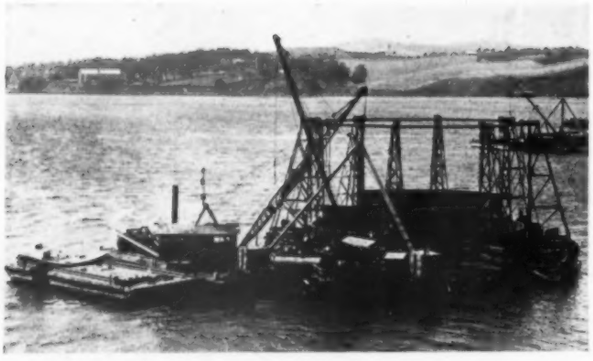
For the erection of the lift span the falsework span had to be shortened to permit it to be floated between Piers 12 and 13 and upon the completion of the lift span it was again extended to its original length for the erection of the remaining through spans.

The Approaches

The new bridge location naturally calls for the construction of connecting railroad tracks. The amount of new trackage is considerable and the grading involved is large, as the finished project will call for the construction of the equivalent of 20 miles of single track and the reconstruction of 24 miles of branch line to main-line standard.



Forms and Reinforcing for the Shaft of Pier 11



Erecting the Steel Shell at the Site of Pier 12

On the north end, the eastbound track descends on a 2.2 per cent grade to a connection with the main line in a distance of 0.93 mile, this steep grade being permissible in the downhill direction. But to avoid a reduction in locomotive load for full tonnage trains moving from the north or east, it was necessary to provide an ascending grade of not more than 0.45 per cent in the westbound track. This called for 3.64 miles of approach, an entirely new location leaving the main line at Goodyear station and developing a supporting grade line on the foothills to the north.

This line crosses an arm of Suisun Bay, an inlet or marsh area, at an elevation 50 ft. above the surface. As test wells proved the soil to be peat of considerable depth and saturated with water, the conclusion followed that it would be uneconomical to make an embankment, as subsidence would be too great and the track unstable. It was therefore decided to build an 1860-ft. steel viaduct instead. This will consist of twenty-one 50-ft. clear spans and twenty 30-ft. tower spans. The concrete pedestal piers will rest on 16 piles of a maximum length of 80 ft. below the cutoff, which is below the water table.

On the south end of the bridge there is a double-track approach, on a maximum grade of one per cent extending to Martinez station. It is not possible, except at unjustifiable expense, to obtain a flatter grade, but a one-per cent grade against eastbound traffic was not considered very objectionable as it will not be very restrictive to passenger trains and freight trains can be assisted by helper engines which will always be available, because of the large number of industries at Martinez requiring engine service.

The San Ramon Connection

Furthermore, the majority of freight trains moving to and from San Francisco, and points south thereof, will be handled over the reconstructed San Ramon branch. This will have a connection to the bridge on a 0.6 per cent grade ascending eastward. Freight destined for Oakland, or the East Bay territory as it is commonly called, and all passenger trains will still continue to move via Port Costa. To facilitate such a movement a second track has been constructed from the bridge to a connection with existing double track at Port Costa, 4.4 miles.

The construction of the double-track approach on the Martinez end also involved the problem of marshland, but owing to more generally favorable conditions the line was placed on embankment. Subsidence and outward bulging of the mud strata occurred but as excellent filling material was economically available, the job was accomplished satisfactorily.

An electric interlocking plant will be provided from which the switches of the diverging routes will be operated. This control will extend to the bridge, with check-locking and telephone communication between this tower and the one on the bridge, to insure proper handling of train movements.

The main lines are equipped with automatic block signals and in addition to the signals and interlocking plants an automatic train stop system will be installed on each side of the lift span. The control of the bridge-operating machinery, including the locks, rail locks, and signals, will be handled by a seven-lever, electro-pneumatic interlocking machine, provided with the customary mechanical approach and electric locking to insure that each function is operated in proper sequence and completely protected. All necessary navigation aids will be provided and, in addition thereto, the tops of the towers and the top chords of the bridge will be outlined by red lights for the benefit of airplanes.

Impose Added Requirements on Cement

We previously referred to the fact that the specifications for concrete provide for a strength of 2500 lb. per sq. in. in compression and 400 lb. per sq. in. in tension at 28 days. After making exhaustive examinations of the available concrete aggregates, it was decided that cement must be of a fineness such that 85 per cent would pass a 200 mesh sieve, that 3 lb. of diatomaceous silica should be added per 100 lb. of cement, pre-mixed at the cement plant, and that the concrete used in the piers, excepting the tremie concrete, was to be 1:2½:5 mix per volume, or 1:2.4:4.6 by weight, and with a water ratio of 0.9.

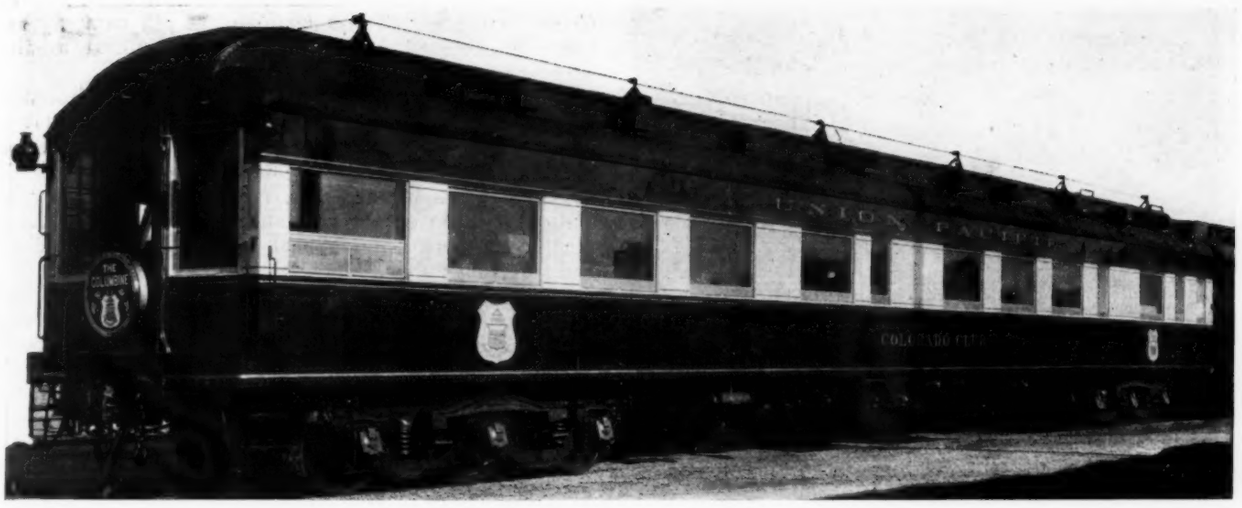
The cement, as manufactured, is placed in bins assigned to the particular job and after our cement tester has approved its quality, the bin is sealed and shipments to the job made only from this bin.

On account of the temperate climate, freezing and ice troubles will not exist, but it was necessary to consider the action of the salt water on concrete. Therefore, that portion of the concrete from a few feet below low water to a few feet above high water is a 1:2:3 mix, using 1½-in. rock. This concrete is poured dry and is subject to special spading and tamping so that a very dense concrete is obtained. The surface is also treated with two coats of a coal-tar paint selected after tests proved that it penetrated into the pores of the concrete.

The construction of the railroad approaches involved extensive grading operations. The contractor on the south end, the George Pollock Company, excavated and placed about 400,000 cu-yd. of material, and the contractor on the north, R. G. LeTourneau, placed about 500,000 cu. yd.

* * *

The New Southern Pines (N. C.) Freight Station of the Seaboard Air Line



Exterior View of the New Union Pacific "Colorado Club" Car

New Train is Named for the Colorado State Flower

The Columbine, distinctive new Union Pacific-North Western train, provides ultra-modern passenger service between Chicago and Denver

THE official flower, crest and colors of a state, for the first time in the history of railroad travel, are incorporated in the newly-equipped train, "Columbine," operated jointly by the Chicago & North Western and the Union Pacific between Chicago and Denver, Colo. Planned throughout to suggest the state of Colorado to the traveling public, the Columbine carries as one of its features a "Colorado Club" car, with an exterior finish of blue, silver and gold, which are the colors of the state flag of Colorado. The car also bears the crest of Colorado emblazoned on its sides.

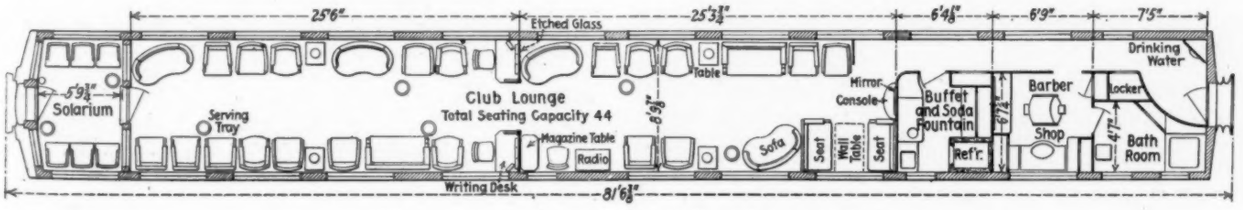
Named for the state flower of Colorado, the new equipment incorporates the columbine motif in all its decorations and furnishings. The figure of the columbine is woven into the carpet and appears in the decorations of the car walls, on the china and glassware of the dining car, on parchment lamp shades, and is etched into the glass partitions.

To further carry out the Colorado idea, paintings of typical scenes from the state hang on the walls of the club and dining cars, and a large Colorado rainbow trout is on display in the train's barber shop.

While the new, luxurious club-lounge car carries the name "Colorado Club," all other cars in the Columbine carry the names of flowers and trees characteristic of Colorado. Among these are Morning Glory, Wild Rose, Kinnikinick, Blue Gentian, King's Crown, Alpine Pink, Alpine Clover, Alpine Bluebell, Anemone, Gilia, Silver Spruce, Alpine Buttercup, Douglas Fir, Pinon Pine and Balsam Fir.

This rear car contains a club, a solarium and a salon, having the freedom of a lounge with the beauty and dignity of a drawing room. The principal colors of decoration are beige, fawn and café au lait. Again the guiding motif is the columbine. This interior is an analogous scheme of colors with a judicial placing of ornaments and contrasting hues of equal intensity.

All of the furniture is finished in ebony, enhanced by silver strips, being designed exclusively for the space it occupies. Comfort and convenience were the cardinal guides in its selection, the coverings being featured



Floor Plan of the Club Car of the "Columbine"

The Columbine Motif Is Apparent in All Details of the Club Car Interior

by unity of general design but with sufficient variety of colors to provide pleasing contrasts.

A radio lounge is available for the entertainment of those who wish it. The finest examples of the glass etcher's art is shown in the partitions separating one division from another. There are tables and lamps, draperies and furnishings which one little expects to find in a railroad car.

The solarium also is highly distinctive. The color scheme in this room is straw color, Nile green, black and chocolate brown. The curtains are chintz, and a floor of rubber, designed to represent intersecting plans in composition, forms an unusual base.

Dining-Car Interior Finished in Blue

The dining car may well be called a symphony of warm blue, combining four-tone values but without sharp contrasts. Gold colored curtains complement the walls and a light mauve defines the window casings. A running band of conventionalized columbine follows the cornice moulding in studied irregular form. The panels between the windows are outlined in fine lines of gold and Van Dyke brown. A hand-painted, clustered, ornament depicting the various forms of the columbine is a motif in pastel colors, placed in pleasing relation to the panel field.

Harmonious and Distinctive Interior Decoration Features the Diner

Four painted pictures, two at either end, show typical Colorado scenes. These pictures are not camera-like, but are executed in color mass, harmonized to the decorations.

The china for the dining cars, especially designed and manufactured for these trains, also features the columbine. The rather wide band is in black, and the china itself is a cream color, or just off white.

All the cars in the train, from the baggage car to the observation car, were planned for maximum comfort, convenience and appeal to the artistic sense of the traveling public.

In the construction, the steel dining cars have clerestory roofs and end diaphragms, without platforms. The trucks are of the six-wheel type, having cast-steel frames, clasp brakes and rolled-steel wheels. The cars are 82 ft. 11½ in. over buffers. The dining room is 38 ft. 9 in. long and is provided with six tables, each seating four people, and six tables, each seating two people, giving a total seating capacity of 36. The ends of the tables are rounded. They present an excellent appearance and afford more room for the waiters in serving than is the case with square-end tables.

The kitchen is 15 ft. 4 in. long by 6 ft. 7½ in. wide. The pantry is 8 ft. 10 in. long by 6 ft. 7½ in. wide. Between the pantry and dining room there is a lobby 6 ft. 1 in. long by 3 ft. 9 in. wide.

At the steward's end there is a bulkhead, placed 7 ft. from the end of the car. In the compartment thus formed is placed a refrigerator, crew's locker, etc., and through the center of the compartment there is an entrance lobby 4 ft. wide. Between the kitchen and pantry and the side of the car is a passageway 25½ in. wide, provided with a swinging door.

The arrangement of the kitchen and pantry as to range, refrigerators, tables, shelving, etc., is in accord with Union Pacific practice, which was developed over a number of years.

The windows throughout the car, 4 ft. 3 in. wide, are of the double-type, and fitted with polished plate glass. In the dining room there are six center lighting fixtures, and on the lower decks are 12 small lights, six on each side. The heating apparatus is of the latest type, and proper ventilation is secured by induced-draft ventilators. There are five electric ceiling fans in the dining room and two electric exhaust fans in the kitchen.

Details of the Club-Lounge Cars

In addition to club and solarium rooms, the club-lounge cars carry a buffet, a barber shop and a bath room. These steel cars also have clerestory roofs and end diaphragms, without platforms. The trucks are of the six-wheel type, having cast steel frames, clasp brakes and rolled-steel wheels.

The cars are 81 ft. 6⅜ in. over buffers; the club-lounge is 50 ft. 9¾ in. long; the solarium, 5 ft. 9¾ in. long; the buffet, 6 ft. 4⅛ in. long by 6 ft. 7¼ in. wide; the barber shop, 6 ft. 9 in. long by 6 ft. 7¼ in. wide, and the bath room, 7 ft. 5 in. long by 4 ft. 7 in. wide.

Between the solarium and club-lounge there is a bulkhead with a door at the center and plate glass windows on each side, and between this observation and the lounge compartment there is a cross-partition with etched plate glass panels on each side and portieres between. Alongside of the buffet, barber shop and bath room there is a passageway 25½ in. wide.

The windows throughout the car are 4 ft. 6 in. wide and are of the double type, polished plate glass being used. The windows in the solarium are of a

special type. The outside and inside panes of polished plate glass are mounted in aluminum bottom rails. The glass tracks in felt runways at the sides and the top and bottom of the windows are weatherproofed by felt packing. This window construction provides maximum vision and is weather, dust and rattle proof. Under the outside windows are provided fixed screens and the inside windows are equipped with an automobile type of operating mechanism, by which the windows are readily raised or lowered.

In the club-lounge there are eight large center ceiling lights and on the walls, between the windows, there are ten bracket lights, each light having two bulbs. In the ceiling of the solarium there is a large dome in which there is a lantern type of lighting fixture.

The heating apparatus is of the latest type and

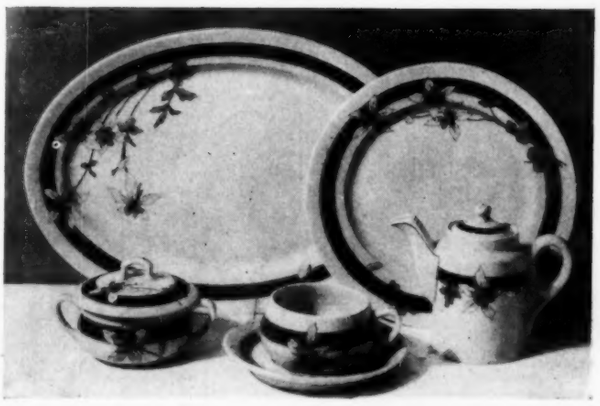
Close-Up View of the Radio, Oil Painting and Other Decorations in the Club Car

proper ventilation is secured by an ample number of reduced-draft deck ventilators. There are four electric-paddle ceiling fans and four electric exhaust fans in the observation-lounge compartment. There is also one electric exhaust fan in the solarium.

The buffet is provided with a soda fountain, refrigerator, juice mixer, coffee urn and facilities for the proper storing and handling of bottled items, cigars and cigarettes. The barber shop and bath room are provided with modern equipment. Over the tub in the bath room is placed a shower, and a locker is provided for the clothes of the passengers while taking a bath.

The car is provided with the following equipment in the way of chairs, sofas, etc.: 6 wicker chairs, 1 small chair, 20 lounge chairs, 6 sofas, 1 seat section and table, 6 tables, 1 console table with mirror above, 2 writing desks and chairs, 1 radio and 7 serving-tray stands, placed throughout the car. The total seating capacity is 44.

All furniture, portieres, table covers, etc., in the new



China in the New Union Pacific Diner Carries a Reproduction of the Columbine

train were furnished by S. Karpen Brothers, Chicago; carpets and platform rugs being supplied by Midgley & Borrowdale, Chicago. Other specialties included lighting fixtures and table lamps, furnished by the Safety Car Heating & Lighting Co., New York; windows in the solarium by the National Lock Washer Company, Newark, N. J.; window curtain material by The Pantasote Company, Inc.; rubber floor covering by the United States Rubber Company, New York, and etched glass, paints, varnish, etc., by the Pittsburgh Plate Glass Company, Newark, N. J.

THE YEAR 1264, ANNO DOMINI, appears in the latest item of railroad news. This is the year in which Merton College, Oxford, England, came into the ownership of an oak tree which stood near the Manor House at Cuxham (and so far as appears, has stood there for centuries) and which tree has now been used to provide paneling for a new dining car which has just been put in use on the International Limited of the Canadian National, running between Montreal and Chicago. This train is the fastest long-distance train in the world. This single tree, says our informant, was the largest oak in England and one of the oldest, and it has provided all of the paneling for the dining car referred to. Passengers entering this car will also see various other kinds of rare woods.

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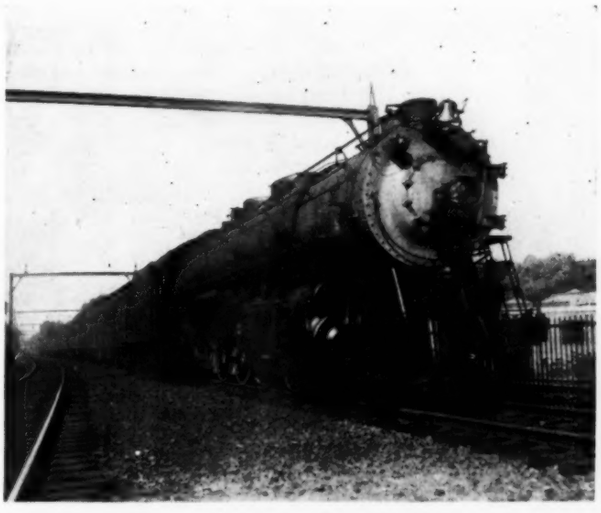


The Delaware, Lackawanna & Western's "Chicago Limited" Passing South Orange, N. J.—Partially Completed Electrification Work in the Background

Over 400 Persons Attended the Convention

Freight Claim Agents Hold Annual Session at Seattle

Prorating destination recooperage expense favored by eastern lines and opposed by western

THE prorating of destination recooperage expense among the carriers participating in the transportation of fresh fruits, melons and vegetables commanded considerable attention at the thirty-ninth annual session of the Freight Claim Division of the American Railway Association held at the Olympic Hotel, Seattle, Wash., on June 10 to 13. Chairman J. D. Shields, freight claim agent of the Chicago, Burlington & Quincy, presided over the meeting, which was attended by 430 railroad representatives and members of their families. The program included committee reports, resumés of the activities of the various claim conferences and addresses by executives of railways and industries. On the third day, a shipper-carrier luncheon was held with the co-operation of the Pacific Northwest Industrial Conference of Portland, Ore., Tacoma, Wash., and Seattle.

In addition, the representatives chose Louisville, Ky., as the place for the 1931 session and elected officers for the ensuing year. These are as follows: Chairman, A. R. McNitt, freight claim agent of the Union Pacific at Omaha, Neb.; first vice-chairman, H. J. Freeman, freight claim agent of the Pennsylvania at Philadelphia, Pa.; and second vice-chairman, H. M. Moors, freight claim agent of the Southern Pacific at New Orleans, La.

Committee Reports

The discussion of the prorating of destination recooperage expense followed the reading of the report of the Committee on Loss and Damage Rules. In answer to a suggestion by J. M. Heath, freight claim agent of the Lehigh Valley, that a subdivision be made to one of the loss and damage rules, the committee recommended that a new rule be formulated to cover recoopering. Under this new rule the expense incurred by the carriers at the final destination in reconditioning or recoopering packages of perishable freight would be prorated on a mileage basis from the initial point to the final destination.

H. C. Pribble, general claim agent of the Atchison, Topeka & Sante Fe, and R. G. Fagan, superintendent of freight protection of the Southern Pacific, maintained that such a practice would be unfair to originating lines since much of the expense is due to looseness in the inspection at the point of delivery. Mr. Fagan supported this position by data tending to show that the containers and loading and stowing methods employed by the originating lines were not responsible for the recoopering expense of the destination lines. H. C. Barlow, manager of freight claims of the Erie, a destination line, favored the proposed rule, contending that recoopering was the result of improper loading and poor containers. H. T. Lively, general claim agent of the Louisville & Nashville, a neutral line, summarized the various points at issue. He said that recooperage expense was confined to a limited territory and that only a few points handled enough fresh fruits and vegetables to justify the setting up of the machinery necessary to carry out the plan. By establishing a rule which affects only a few carriers, he said, an injustice is done those who are not involved, and by applying the rule to a particular group of commodities, the door is opened to unlimited difficulties since the application of the rule to other commodities, livestock, automobiles, etc., is equally

justifiable. He classed the cost of recoopering as an operating expense that should be borne by the lines delivering the shipments in the same manner as the cost of securing business is carried by the originating lines.

Report of Prevention Committee

The Committee on Freight Claim Prevention of which W. C. Johnson, freight claim agent of the Chicago & North Western, is chairman, presented an analysis of freight loss and damage which included a summary of existing conditions and an outline of preventive measures. The report showed an increase of $875,723 in all loss and damage in 1929 as compared with 1928, the amount for 1929 being $37,432,966. It directed particular attention to the increase of $1,571,615 in charges to unlocated damage and rough handling, which sum is almost twice the amount of increase for the account as a whole. Of the former amount, $1,275,807 or 81 per cent is chargeable to fruits, melons and vegetables, while for the five year period ending with 1929 there was an increase of $3,506,537 of which $3,264,506 or 93 per cent was for fruits, melons and vegetables. Attention was also called to the number of claims of all classes presented, the amount carried in suspense, and the number of claims under investigation at the end of the year which show slight increases, not out of line, however, with increased car loadings for the same period. The number of claims presented during 1929 totaled 2,626,125, an increase of 150,507 or 6.1 per cent as compared with 1928. The number of claims under investigation at the end of 1929 was 211,531 in contrast to 205,439 at the end of 1928. The amount in suspense at the close of 1929 was $2,771,984 which exceeded the amount for 1928 by $621,019 or 28.9 per cent.

Detailed statistics in the report showed that, in contrast to the decreases of 38.7 per cent in delay and 35.1 per cent in temperature failures from 1922 to 1929, claim payments due to rough handling and unlocated damage (broken packages), increased 132 per cent. Since 1922, at which time delay and temperature failure amounted to 53 per cent of the entire account, there has been a decided improvement up to the present time when payments due to these causes were only 27.4 per cent of the total. In contrast, the broken-package item has gradually increased to 63.6 per cent as compared with 33.1 per cent in 1922.

To correct this condition, the support of other divisions of the A.R.A. has been secured. The Operating Division has issued a circular outlining uniform practices to be followed at destination points, while the Transportation Division has issued another containing recommendations of a like nature. This procedure was followed by action on the part of destination lines in New York and New Jersey on March 17, 1930, when they established regulations governing the delivery of consignments. Further developments occurred at a special meeting of the A.R.A. in Chicago on May 15 when the executives were made responsible for all claims on their roads.

Another portion of the report dealt with the outstanding features of other items of the loss and damage account. To eliminate loss and damage to automobiles, a special committee of the Chicago and Eastern Claim Conferences is co-operating with representatives of the industry in a study of methods whereby damage to automobiles can be reduced and more definite information as to the exact causes for damage secured. A review of special reports from 30 roads, with respect to claims of over $100 each paid for damage to machinery during the six months ending April 1, 1930, shows that the average amount involved in 226 claims on new machinery was $287.40 and in 129 claims on second-hand machinery was $400.44. When an analysis of these reports is completed it will be furnished to the appropriate branches of the A.R.A. for corrective action. The main trouble arises from shifting, tipping over, or breaking of legs. Claims on second-hand machinery being relatively numerous and large, the desirability of having the crating, bracing in cars, etc., carefully inspected and supervised is apparent.

Other reports presented included that of the secretary, that of the Committee on Overcharge Rules, that of the Committee on Rules of Order and that of the General committee. These dealt with detailed rules governing claim work and summaries of activities during the past year.

Prevention Activities of Claim Conferences

The afternoon of the first day was devoted to reports on the prevention activities of the various freight-claim conferences. H. V. Cooper, superintendent of freight loss and damage claims of the Gulf Coast Lines represented the Southwestern Claim Conference and described the perishable situation in the Rio Grande valley. Prevention efforts, so far, have been directed towards

Tomatoes Loaded Crosswise Were Not Damaged During Shipment from Texas to New York, While Those Loaded Lengthwise Were

the commodities moving in the greatest volume and resulting in the greatest claim expense. Under this plan, the lettuce shipments were among the first things to come under scrutiny. By requiring the use of three nails in the side and bottom slats of the Los Angeles lettuce crate, which is used extensively in the valley, by inducing shippers to use parchment instead of wax paper and by close supervision to insure proper loading, breakage claims have been greatly reduced. In addition to these improvements a shipper has devised an end frame for this crate that has also helped to reduce breakage.

This conference is also extending every possible effort to standardize citrus fruit containers and loading methods. Surveys made by engineers of the Container bureau revealed that seven different types of containers were in general use last year. As a result conferences have been held with shippers and box manufacturers to establish standard containers. The use of the bushel basket for Texas vegetables has been discouraged and the use of these baskets for the shipment of root vege-

Failure of Crates Is Often Chargeable to Top-Icing

tables has decreased about 75 per cent in the last two years while the elimination of this container from general use, except for shipments of spinach, is expected soon.

E. Y. Graves, superintendent of stations and transfers of the Seaboard Air Line, in discussing the Florida perishable situation as a representative of the Southeastern Claim Conference, said that the latter had appointed a special watermelon committee to study the watermelon situation and to submit recommendations for reducing claims on this commodity. This committee has been able to incorporate in the tariff certain loading rules to be followed by shippers.

Rough Handling Tests at Chicago

V. W. Landon, secretary of the Committee on Coordination of Chicago Terminals of the General Managers Association, described the results of an analysis of rough handling based on the use of impact recording devices. The tests started on April 26, 1929, and covered 1,540 test trips, 5,310 yard tests, and 3,407 transfer-train tests. That the tests have improved conditions is indicated in a tabulation of results which shows that, while 64 test trips were made in June, 1929, with an average of 1.53 impacts at 6 miles per hour or over, a total of 177 test trips in March, 1930, averaged only 0.94 impacts. Out of a total of 1,540 test trips it was possible, in the case of 1,483, to determine in what yard or between what yards impacts occurred. A total of 98.4 per cent of the impacts occurred in yards and 1.6 per cent in trains, while in 30.8 transfer-train tests the impacts were five miles or more per hour.

As a check on the employees who are responsible for the placing of registering devices in cars, monthly statistics are compiled and these show that freight-house forces can be relied upon to assist in the efforts to reduce the improper handling of cars. The statistics also show that of the 1,483 test trips in which impacts of five miles or more per hour could be charged to particular yards, 26.8 per cent of the impacts occurred in originating yards, 25.6 per cent in terminating yards and 36.6 per cent in intermediate yards.

The tests have revealed other interesting facts. Railroads found that tracks in certain yards required regrading and that day men are no more careful in the handling of cars than night men. They also learned that flat yards doing similar work compare unfavorably with hump yards and that hump yards with car riders show somewhat better results than hump yards equipped with car retarders. While a large portion of the test cars handled in retarder-equipped yards show some impacts, the intensity of these impacts is usually five or six miles per hour and the number per yarding is noticeably smaller than in flat yards.

Destination Conditions

J. K. Lovell, freight claim agent of the New York Central, spoke on destination conditions when outlining the activities of the Eastern Claim Conference. He referred to the new practice of handling fresh fruit and vegetable shipments entering the metropolitan area of New York established on March 17, 1930, saying that since that date the salvage realized from broken packages has increased while the average number of damaged packages not accepted by consignees as in perfect condition has been less than the number previously delivered with exceptions. As a further step toward the reduction of damage and in an effort to secure greater uniformity in the making of exception notations on freight bills or joint unloading reports, trunk lines adopted exception stamps for use on joint unloading reports.

On May 7, a meeting was called by the Traffic Executive committee of the Trunk Line Association to consider uniform rules to govern the inspection of fresh fruits and vegetables and a special committee was appointed to consider this subject. This committee has reported certain recommendations to the Traffic Executive Committee and further action is expected soon.

R. A. Podlech, chief of the freight claim prevention bureau of the Atchison, Topeka & Sante Fe Coast Lines, in speaking for the Pacific Coast Claim Conference, said that a lack of co-ordination among the carriers in efforts to adopt uniform practices is seriously handicapping prevention efforts. He cited destination exception reports and notations as to damage on freight bills as one of the items which contributes to claim payments. On many shipments the damage is determined before the cars are unloaded and in several instances of grape shipments improper notations such as "200 boxes broken," "180 boxes broken, worthless" have been placed on freight bills with the result that claim agents are at the mercy of parties filing claims and are obliged to pay exorbitant amounts due to these improper notations. Exception reports carry practically the same information as appeared on delivery documents and are absolutely worthless from a prevention standpoint when no cause is ascribed for the damage. He suggested

that if the carriers do not have men qualified properly to handle the situation at the points where this trouble is occurring, consideration be given the adoption of the same plan that is now in effect at Cleveland, namely government inspections.

Mr. Podlech also recommended co-ordination between claim and prevention departments and with shippers. Unless the prevention men are kept fully advised by the claim men as to what is going on in connection with claim payments, their activities are retarded and conditions causing loss and damage are neglected. Most shippers, he continued, are as vitally interested as the carriers in having their shipments delivered at destinations without loss and damage, and in the majority of cases where loss or damage is occasioned by the use of improper containers, or poor packing, loading or bracing due to negligence on the part of the shipper, it is because of a lack of knowledge as to what is required rather than to deliberate intent. In support of this contention he called attention to the work being done by shippers advisory boards, chambers of commerce and other bodies.

H. R. Grochau, assistant freight claim agent of the Chicago & North Western, in speaking on "Flour Damage—Suggested Remedies," the subject assigned to the Northwestern Claim Conference, mentioned several causes that contribute to damage. In their efforts to reduce damage, representatives of the millers have made a study of car construction and have offered valuable suggestions for improvements. The door post is the greatest factor in damage to flour, mill products and sacked commodities. Statistics compiled by one miller show that 62 per cent of all damage occurs at the door post, primarily due to false door posts. Some carriers apply false door posts to new equipment in order to save the permanent post. He also condemned the acceptance of the consignee's advice as to damage without verification.

Express Prevention Activities

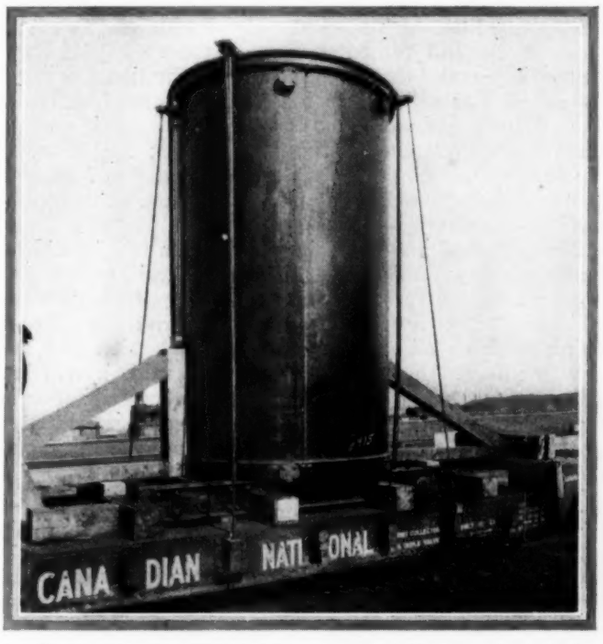
J. H. Butler, general manager of the department of Public Relations of Railway Express Agency, Inc., presented a summary of express activities, saying that in 1929 the number of claims presented was the lowest since the consolidation of express companies in 1918 but that the amount paid in the settlement of claims showed an increase of three per cent, the latter, however, being somewhat off-set by a reduction in the number of claims unadjusted at the close of the year. During 1929, the average time between the presentation and the payment of claims was reduced from 41 to 40 days while the cost of handling claims was cut 4.2 per cent. In addition there was a reduction in the number and amount of claims placed in litigation, the reduction of the former being 8 per cent and that of the latter 21.6 per cent.

J. W. King, freight claim agent of the Chesapeake & Ohio, presented a resumé of the activities of the Virginia Claim Conference referring in particular to furniture damage. The Southern has issued to shippers illustrated specifications for the proper crating and loading of furniture and has secured good results. The Norfolk & Western is arranging for a motion picture which will illustrate crating, loading, handling, unloading and uncrating for the benefit of the employees of shippers, carriers and receivers. The Atlantic Coast Line is trying a plan which is intended to overcome concealed damage. Inspectors either open up the packages and carefully examine the shipments before delivery or follow the shipment to the consignee's place of business for the purpose of immediate inspection.

J. L. McCormack, superintendent of freight loss and damage of the St. Louis-San Francisco, spoke on livestock loss and damage for the Central Claim Conference. He discussed the outstanding causes which contribute to the claims paid by Class I carriers on livestock and offered suggestions for the handling of this traffic.

Several Addresses Presented

Several interesting addresses by railroad and industrial executives were included in the program. Frank Edwards, mayor of Seattle, presented an address of welcome after which Arthur A. Murphy, assistant to the president of the Union Pacific, spoke on "Washington —Past, Present and Future." Others addressing the meeting were: H. G. Taylor, manager of the Public



A 17-Ft. 31-Ton Transformer. The Commonwealth Edison Company, Chicago, Insists on Proper Loading by Supply Companies

Relations Section of the A.R.A. Car Service Division; J. D. Shields, chairman of the Freight Claim Division; W. E. Coman, vice-president of the Northern Pacific; E. A. Jack, general traffic manager of the National Aluminate Corporation; Edward Dahill, chief engineer of the A.R.A. Freight Container Bureau; William C. Fitch, manager of perishable freight traffic of the Southern Pacific; Colonel T. A. Hiam, assistant to the president of the Canadian National; Joe Marshall and Albert L. Green, special representatives of the A.R.A.; and H. D. Morris, assistant claim agent of the Northern Pacific and secretary of the Association of Railway Claim Agents.

Mr. Coman commended the division on the work it had done in reducing claims and reviewed the history of the organization. Mr. Jack, who is also chairman of the Freight Claims and Claims Prevention Committee of the National Industrial Traffic League, told of the activities of that organization and expressed the eagerness of shippers to co-operate in the reduction of claims. Mr. Dahill described the work of the Container Bureau. and outlined the progress being made in container de-

velopment. He said that an improved method of loading soda fountains has enabled certain carriers to recapture some of the traffic which had been given to motor trucks. He also said that a committee had been appointed to investigate top icing and will submit a report to President Aishton on September 1.

Chairman Shields reported that the affairs of the division are in excellent condition and commented upon the work of the various committees. The work of the appeal and arbitration committees, he said, has been reduced considerably, there being only 195 claims appealed and 733 arbitrated during the last fiscal year as compared with 232 appealed and 1,445 arbitrated in 1925.

Association Sponsors Good Will

Mr. Hiam spoke on "The American Railway Association and What it Means to International Good Will." To indicate the value of the A.R.A. to North America he described the difficulties associated with international trade in the Old World because of the variety of languages in use and the absence of an international organization dealing with the various departments of railroad management. He spoke of the Bern convention, an international agreement dating from 1890; the "Streza Agreement" which deals with the interchange of rolling stock; and the International Railway Union, an administration organization.

Mr. Marshall made a claims-prevention talk in which he included pertinent points that can be used effectively among employees engaged in the handling of freight and claims. Mr. Green spoke on the improvement of existing methods of loss and damage prevention and on new methods. For future results, he said, it will be necessary to engage in research, experiment and surveys and to secure the greatest benefits from these, intelligent collection, analysis and interpretation of claim facts and figures are essential.

Shipper-Carrier Luncheon

At the shipper-carrier luncheon on June 12, A. R. Currie, vice-president of the General Fruit Corporation, Seattle, acted as toastmaster while the speakers were J. D. Shields, F. E. Winburn, special representative of the A.R.A. Committee on Freight Claim Prevention, Nathan Eckstein, president of Schwabacher Brothers & Co., Inc., Seattle, and J. F. Meyers, traffic manager of W. P. Fuller & Co., Portland. Mr. Winburn and Mr. Shields described the attitude of the railways in dealing with claims while Mr. Eckstein and Mr. Myers expressed the good will and earnestness of the shippers.

* * *

East and West Bound Transfer Trains on the Indiana Harbor Belt, Chicago

Freight Car Loading

WASHINGTON, D. C.

FREIGHT car loading in the week ended June 7 amounted to 935,647 cars, a decrease of 120,121 cars as compared with the corresponding week of last year and of 59,923 cars as compared with 1928. All classes of commodities participated in the reduction but the largest decrease was in the loading of miscellaneous freight, which showed a drop of 50,840 cars. The Southwestern district reported an increase as compared with both 1929 and 1928 but all other districts showed reductions as compared with both years. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading
Week Ended Saturday, June 7, 1930

Districts	1930	1929	1928
Eastern	212,307	243,691	230,110
Allegheny	189,663	219,796	204,590
Pocahontas	52,448	59,401	55,897
Southern	126,783	145,245	136,918
Northwestern	150,984	176,092	161,728
Central Western	129,096	137,630	135,791
Southwestern	74,366	73,913	70,536
Total Western Districts	354,446	387,635	368,055
Total All Roads	935,647	1,055,768	995,570
Commodities			
Grain and Grain Products	38,524	38,974	34,254
Live Stock	23,900	24,457	27,764
Coal	135,858	149,858	151,032
Coke	9,745	12,390	9,653
Forest Products	50,975	69,993	64,224
Ore	63,450	79,454	66,618
Merchandise L.C.L.	243,753	260,360	256,171
Miscellaneous	369,442	420,282	385,854
June 7	935,647	1,055,768	995,570
May 31	860,249	972,825	934,673
May 24	931,472	1,062,088	1,021,403
May 17	930,004	1,046,594	1,003,288
May 10	933,391	1,048,960	1,002,411
Cumulative total, 23 weeks	20,423,506	22,380,840	21,467,901

The freight car surplus for the last week of May averaged 441,503 cars, an increase of 12,944 cars as compared with the preceding period. This included 233,664 box cars, 148,873 coal cars, 30,101 stock cars and 15,350 refrigerator cars.

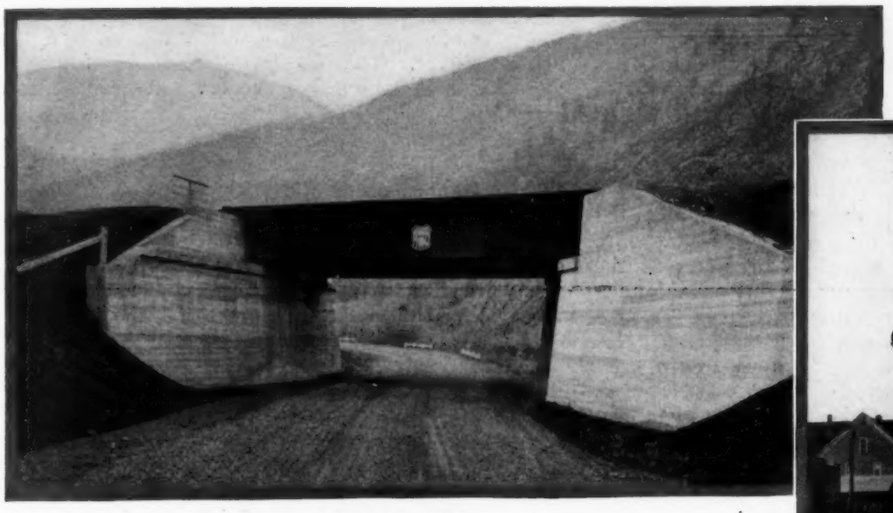
Car Loading in Canada

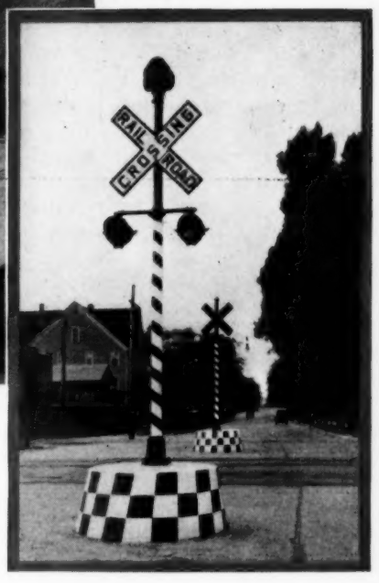
Revenue car loadings at stations in Canada for the week ended June 7 totaled 66,487 cars, a decrease from the previous week of 1,258 cars, and a decrease from the same week last year of 6,938 cars.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada		
June 7, 1930	66,487	31,162
May 31, 1930	67,745	33,658
May 24, 1930	57,937	34,637
June 8, 1929	73,425	38,981
Cumulative Totals for Canada		
June 7, 1930	1,337,216	829,972
June 8, 1929	1,481,623	988,103
June 9, 1928	1,458,820	913,514

"SAFETY-FIRST SHOES"—shoes with a steel toe cap inside the leather cap are now worn by many shop employees of the New York, New Haven & Hartford and the company is so well satisfied with the design of the shoe, as a safeguard against foot accidents, that it has arranged to have salesmen travel throughout the company's lines to offer the shoes to employees; and payment may be made by deduction from the payroll. The shoes cost $3.95 a pair. In three months, on this road, 119 foot injuries were sustained by employees, 32 of which were of sufficient importance to be reported to the Interstate Commerce Commission. These injuries altogether led to 1,074 days' lost time. The shoes are recommended to shopmen, car inspectors, trackmen, and all classes where the hazard is appreciable.

Grade Separation—Is It the Solution For Crossing Accidents?*





Complete Elimination (left) or Protection (below) with Careful Motorists

Railway-highway accidents most frequent in states with lax drivers' license laws

By Charles W. Galloway
Vice-President, Baltimore & Ohio

IN 1929 31,500 persons died in automobile accidents, an increase of 13 per cent over 1928, and equivalent to the death of one person every 17 minutes. In the previous year deaths averaged one every 19 minutes. Consequently, the situation is getting worse. When measured in comparison with the casualties in the World war, automobile accidents last year alone took a toll of life equal to 40 per cent of all the casualties to American participants. The 31,500 who were killed in automobile accidents last year constituted about 33 per cent of the total of all fatal accidents. Considering accidents from all causes, one person out of every 12 is injured every year—a most serious situation.

In the 10 years from 1920 to 1929, inclusive, on all railroads in the United States, there were 579 passengers killed, while the total number of passenger casualties on railroads in the 10 years was 22,854. The number of persons *killed* in automobile accidents in *one* year is 39 per cent greater than the number of railroad passengers *killed and injured* in *ten* years. During this period, passenger trains ran 5,600,000,000 miles and the railroads carried 9,300,000,000 revenue passengers a total distance of 360,000,000,000 passenger miles.

Seven Per Cent of Fatalities Occur at Crossings

During the 11 years from 1919 to 1929, inclusive, 23,628 people were killed in accidents at grade crossings on all railroads in the United States, while during last year alone, 31,500 were killed in all accidents to automobiles. The figures for 1929 show that 2,085 were killed at grade crossings, or only about 7 per cent of the total killed in automobile accidents.

It would seem, therefore, that the railroad grade crossing, about which we hear so much, is not the place to look for the correction of this trouble; yet, hardly an accident occurs at a grade crossing that there is not a great clamor from every direction, demanding the removal of the crossing, utterly disregarding the factor that really should have consideration, and that is—what is being done to insure better supervision and control over those who are permitted to operate motor-driven vehicles. Typical of this particular point is an accident that occurred recently at a grade crossing in Ohio, where the motorist, in a snow storm, was driving at such a furious rate of speed that his motor car skidded on to the tracks, colliding with the train, and in the mixup the crossing watchman who tried to stop the driver was killed. Immediately there appeared in a local paper a "bulletin" urging that a bond issue be placed before the voters at the next general election for the elimination of the hazardous grade crossing, wholly disregarding the fundamental cause.

While over 29,000 persons were killed at points other than at railroad grade crossings, many at intersecting highways, I do not believe it can be found in any case that any question has ever arisen or any clamor has been made for the separation of grades of intersecting highways.

During the calendar year 1929, there were 5,975 accidents at highway grade crossings, which resulted in

* An address presented before the Associated Traffic Clubs of America at Cincinnati, Ohio, on April 24.

the death of 2,485 and the injury of 6,804 persons. Automobiles figured in 5,191 of these accidents, which resulted in the death of 2,085 and the injury of 6,347 people. There were also 36 derailments of trains as a result of collisions between trains and automobiles, causing the death of 23 and the injury of 53. In addition, there were 17 derailments of trains as a result of collisions between trains and automobiles, but without death or personal injury.

Comparing 1929 with 1922, there was an increase of 116 per cent in the total number of motor cars registered in the United States; the fatalities increased 136 per cent. It would seem from these figures that experience does not improve the situation.

To eliminate all of the grade crossings on the Baltimore & Ohio would cost approximately six hundred million dollars, and the best figures obtainable indicate that their elimination on all the roads in the United States would cost abouty twenty billion dollars, a figure approximately equal to the tentative valuation of the railroads as fixed by the Interstate Commerce Commission. This makes the proposition prohibitive, and it will be many generations before this is accomplished, if ever. Despite the efforts that are being made to reduce the number of grade crossings, there was a net increase of 1,697 such crossings in 1928, according to figures of the Interstate Commerce Commission. This increase follows a net gain of 952 in 1927, of 1,457 in 1926, and an estimated gain also in 1929.

It has not been many years since the general demand for the elimination of highway grade crossings began. Since then the Baltimore & Ohio alone has eliminated 246 crossings, at an expenditure of slightly in excess of eleven million dollars; other roads have done as much or more. We have before us now the expenditure of approximately twenty-eight million dollars for the elimination of grade crossings. Nearly half of this work is under way. In Ohio alone, highway grade crossing elimination projects have been authorized on the Baltimore & Ohio, and are under way in the amount of $4,085,000, with projects pending to cost another million dollars.

The Source of Grade Elimination Expenditures

The money with which the railways meet the enormous cost for the elimination of grade crossings must come from earnings. The states, however, provide for their proportion of these costs in a different way. The 48 states and the District of Columbia, in 1929, collected $431,636,456 in taxes from the sale of 13,400,000,000 gal. of gasoline. Not only have the railroads no way, except from their earnings, of recouping what they put into these improvements, but, being taxpayers, they also contribute to the cost of such work.

Ten years ago it occurred to me that we should make some observations of the manner in which motor vehicles cross our tracks at grade at the principal highways on our line. We set up what we thought was a fair standard to be expected of a motorist in crossing railroad tracks at grade: Was speed reduced approaching the crossing; did the driver look and apparently listen—in other words, did he indicate by his conduct in the driving of the car that he was interested in determining as far as possible whether the way was clear and safe. These observations were made by subordinate officers who had been schooled for the purpose. In the 10-year period they have reported about 3,028,000 observations, of which number 397,706, or more than 13 per cent, were failures. These failures indicate that in that many instances drivers fail to exercise proper care in approaching and crossing the tracks at grade. The motorists in the Baltimore & Ohio territory east of the Ohio river were substantially better in their observance of safety rules than the motorists in the territory west of the Ohio river, the difference against the western territory being about 17 per cent.

Ohio had the greatest number of grade crossings accidents in 1929 and I attribute this largely to the fact that state officers have been unable to make the Legislature realize the importance of this question and enact laws for the supervision and control of the motor vehicle driver. Two hundred and twenty-four people were killed in automobile accidents at grade crossings in Ohio alone in 1929, while in New York, with its enormous traffic, only 148 were killed.

A recent issue of the Maryland Motorist reported that "certain eastern states have reduced accidents about 20 per cent through license laws requiring examinations of all new drivers. The following states now have drivers' license laws: Arizona, California, Connecticut, Delaware, District of Columbia, Indiana, Maine, Maryland, Massachusetts, Nebraska, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont and Wisconsin. Wisconsin, one of the five states in the entire Middle South and West to have a drivers' license law, was also one of the five states in the country to show a decrease in motor vehicle fatalities last year."

Only 10 Per Cent of Drivers are Fit

After reviewing the requirements imposed upon the student before a license to drive is granted, I would say that not more than 10 per cent are fit to drive under the very limited supervision that, generally speaking, now exists. While some states have no regulations or definite requirements for the licensing of a motor car operator, the figures we have been able to develop indicate that the average motorist is created in about 17 minutes, and that he undertakes to drive a machine which can be operated at a speed equal to that possible with the average passenger locomotive, and which has no course definitely to guide it beyond that of the right of direction and, consequently can be, and is, driven all over the highway at the will of the operator—quite in contrast with a passenger locomotive engineman. After this observation of the student's conduct, I had taken from our files at random the records of 50 passenger locomotive enginemen running high-speed trains. From the time these men first entered the service in the apprentice capacity of student firemen until they first ran a passenger locomotive, was 17 years. It did not, of course, require 17 years to qualify these men, but the fact remains that they were that long in seasoning, running on tracks that guide them, under signals that, so to speak, talk to them, and under definite rules and closest supervision to see that they are obeyed. When one rides in a passenger train he has almost definite assurance of safety because of the qualifications and thorough seasoning and supervision over the fine body of men running locomotives, as against the inexperience and incompetence of motorists to which we constantly expose ourselves on the highways.

If a locomotive engineman should fail to stop at a red signal, unless he had an exceptionally good record, the penalty is dismissal. Although we have spent almost a million dollars to install flashlight signals for the protection of the motorist at highway grade crossings, we know definitely that these signals are frequently disregarded by the motorists, many times resulting in fatalities. These signals are operated through the track

circuit in the same general manner that the electric automatic signals governing the locomotive engineman are operated, and yet we accept without concern the disregard of these signals by motorists—a thing we would not tolerate for one minute by a locomotive engineman. As proof of this statement, in a two-day check which I had made in June of last year at certain crossings on our road, controlled by flashlight signals and bells, we found 140 instances of motorists disregarding the flashlight signals, most of which occurred on only one of the two days the check was being made. This is typical of many similar checks.

Only five years ago the newspapers carried a story that that date marked the thirteenth anniversary of the greatest marine disaster in the history of the Atlantic, when the White Star Liner "Titanic" went down off the Grand Banks of Newfoundland in 1912, with a loss of 1,517 lives, after colliding with an iceberg. As a result of this one disastrous accident, action was taken immediately to guard against a repetition, and with obvious success, while 31,500 persons died in automobile accidents last year alone, and, aside from the clamor for the elimination of highway grade crossings at railroads and the installation of signal lights that are so frequently disregarded, nothing is seemingly being done by the lawfully constituted authorities to improve this situation; at least such effort as is being made is not effective.

New "Fifth System" Plan Proposed

P. & W. V. interests aspire to leadership of system assigned by I. C. C. to Wabash

WASHINGTON, D. C.

A PLAN for the acquisition and eventual consolidation of many of the railroads assigned to the Wabash system in the Interstate Commerce Commission's consolidation plan under the leadership of the interests which have been in control of the Pittsburgh & West Virginia instead of that of the Wabash was outlined by Frank E. Taplin, president of the P. & W. V., at the hearing on June 16 on its application for authority to acquire control of the Wheeling & Lake Erie. The company also has pending an application for authority to acquire the Western Maryland and Mr. Taplin said that negotiations are now under way for the formation of a company to acquire the holdings of the Pennsylvania Company in the Wabash and Lehigh Valley and the stock of the Pittsburgh & West Virginia held by the Pennroad Corporation which he had sold to it last year in what he "hoped would be only a temporary sale until the financial skies cleared."

He said the plan contemplated that he should be the head of the proposed system and that he had been led to believe by officers of the Pennsylvania companies that they would be willing to sell if the plan works out and that he had no reason to believe that the price would be a stumbling block. He said the interests he represented are prepared to invest $25,000,000 and to acquire complete stock control of all five roads through exchange of stock, "thus accomplishing within a short time that much of the I. C. C. plan for System No. 7." The Pennsylvania would want certain running rights, he said, "which, if agreeable to the commission are agreeable to us." He referred to his plan as contemplating a system independent of the Pennsylvania.

When the P. & W. V. application was originally assigned for hearing the commission assigned for the same date the application of the New York, Chicago & St. Louis for authority to acquire control of the Wheeling. The Nickel Plate now owns certificates of deposit representing something over 51 per cent of the stock of the Wheeling, which is held by a trustee pending a decision as to the ultimate disposition of the property. The Nickel Plate later withdrew its application stating that it proposed to make or join in the making of another, to be accompanied by a motion that the commission modify its plan to include the W. & L. E. in the same system as the Nickel Plate. The Wabash had also filed an application for authority to acquire control of the Wheeling but on June 14 the Commission dismissed this application in response to a letter from the Wabash asking leave to withdraw it. The reasons were stated in the letter, signed by Winslow S. Pierce, general counsel, as follows:

Wabash Application Withdrawn

"In view of the withdrawal of the Nickel Plate application for control of the Wheeling and of its position as disclosed by its intervening petition that the Wheeling stock is wholly inaccessible to purchase by the Wabash, and in view of the commission's already definite allocation of the Wheeling to the Wabash system, the Wabash has determined to broaden its proceedings before the commission. It is asking leave to intervene in the cease and desist proceedings under the Clayton act in respect of the Wheeling stock which are now pending and directed by the commission against the Nickel Plate. It proposes further to ask leave to intervene in the proceedings which the Nickel Plate forecasts for the modification of the Commission's plan in so far as the plan fixes the allotment of the Wheeling.

"The Wabash considers this to be the most effective course to reach the dislodgement of the Wheeling stock from the Nickel Plate control, and it will insist, in the most direct proceedings available to it, upon the clarification of the intercorporate relations in regard to the Wheeling property which have been questioned by the commission and which embarrass and handicap Wabash measures in aid of the commission's allocation of such property. In this view the Wabash is asking leave to withdraw its pending application in Finance Docket No. 8231 without prejudice to its renewal at the earliest appropriate juncture, but retaining its position as intervener in Finance Docket No. 6486."

The intervening petition filed by the Wabash took the position that the application of the Nickel Plate for a stay of the commission's order to divest itself

of Wheeling stock was a further step in the consummation of an illegal agreement and understanding between the B. & O., Nickel Plate and New York Central for the purpose of forestalling an additional competitive system.

Both the Wheeling & Lake Erie and the Nickel Plate had filed motions with the commission for a dismissal of the P. & W. V. application, which it denied. At the opening of the hearing W. S. Bronson, of counsel for the P. & W. V., moved that the commission reconsider and dismiss the intervening petition of the Wheeling. Former Commissioner J. B. Campbell also asked leave to intervene for the Pittsburgh Investment Company as the holder of 100 shares of P. & W. V. stock.

Taplin Interests Seek Nickel Plate Holdings

Mr. Taplin said the P. & W. V. owns 12 per cent of the Wheeling stock while allied interests hold 34 per cent more, including principally himself, members of his family and intimate friends, whom he declined to name. The Nickel Plate owns 51 per cent, including 34 per cent acquired by the Alleghany Corporation for the Baltimore & Ohio and New York Central, he said, and has also acquired part of the remaining 3 per cent. The P. & W. V. is willing to purchase the Nickel Plate stock at cost plus carrying charges, less dividends, with interest, or about $30,000,000, he said, and has arranged to finance the purchase on reasonable terms, by offering to the stockholders of the P. & W. V. the right to subscribe to additional stock to the extent of their present holdings. He assumed the Nickel Plate would be willing to transfer the stock subject to the condition that it be transferred to the parent company of System No. 7 and said it might be desirable to maintain separate operating identity of the properties until the parent company of that system is prepared to take them over, but if desired the P. & W. V. is willing to take a long-term lease and coordinate the properties. Nothing will be done to interfere with the plan of the commission, he added, or to prevent the parent company of System No. 7 from acquiring the properties on reasonable terms fixed by the commission. He also referred to the proposal to acquire the Western Maryland and said that it and the P. & W. V. and W. & L. E. would be a nucleus for System No. 7 or any other desired by the commission, as the shortest and most direct route from Toledo to Baltimore under one management. Mr. Taplin made the point that without such a consolidation the construction of the Connellsville and Donora extensions of the P. & W. V. would be a "needless and wasteful expenditure of funds" and he could not believe the commission would have approved them without the prospect of the consolidation. He said that the experience of the past two years "when the Wheeling was not cooperating with us," has shown that the P. & W. V. cannot prosper without its full cooperation, which requires common control, but that the three roads working together and free of trunk-line control would be a formidable competitor and could effect many operating economies. For example, he said that both the president and a vice-president of the W. & L. E. receive $50,000 a year salaries and that like officers of the P. & W. V. drawing smaller salaries could perform their duties.

P. & W. V. Stock Sold to Pennroad Corporation

Asked regarding the sale of the P. & W. V. stock to the Pennroad Corporation, Mr. Taplin said that last fall he thought he saw a financial storm approaching and "knowing that certain interests were out gunning for me, I decided we should not take any chance of losing control of the P. & W. V." So he had gone to the Pennroad Corporation, feeling that "they would protect me in the whole situation," and had sold 222,930 shares of P. & W. V. stock to it, under a verbal agreement that the management and control should remain as at present, "with no interference in the absence of action detrimental to their investment." There had been no interference, he said, and although the Pennsylvania had unsuccessfully opposed the construction of the Donora extension of the P. & W. V., both before the commission and in court, no request that the work be stopped had ever been received from the Pennsylvania or the Pennroad Corporation.

On cross-examination Col. W. A. Colston, vice-president and general counsel of the Nickel Plate, asked Mr. Taplin if he would be willing to sell the P. & W. V. holdings of Wheeling stock to the Nickel Plate, if the commission should assign the road to that system, for the same price he had offered for the Nickel Plate's holdings. He replied emphatically that he would not, saying: "Our stock is not trusteed. We did not buy in violation of the law and have a right to sell for what it is worth." He said he had bought some of the stock very cheaply but that, after the Van Sweringen people had bid it up, he had had to pay more for some than the Nickel Plate had paid for its stock. He declined to file a statement showing the purchases by the P. & W. V. and the prices paid. Asked by Colonel Colston if he had ever offered his stock for sale to the Nickel Plate he said that it would not get him anywhere to go to the Nickel Plate officials but that he had approached O. P. Van Sweringen two years ago and had not yet received his answer. Colonel Colston continued to press for an answer as to what price he would ask the Nickel Plate for the stock, saying he wished to test the fairness of the P. & W. V. offer, but Mr. Taplin declined to say more than that it would be a "fair price" and C. V. Burnside, assistant director of the commission's Bureau of Finance, ruled that the question of price might be reserved until later. Colonel Colston also asked for a copy of the contract between the P. & W. V. and the Pennroad Corporation but Mr. Taplin said there was nothing in writing.

He also said there was no connection between the transaction and the Donora extension and that the verbal agreement related only to any action that might impair the Pennroad investment, not to action detrimental to the interest of the Pennsylvania.

Mr. Taplin said he had dealt with both Gen. W. W. Atterbury, president of the Pennsylvania, and H. H. Lee, president of the Pennroad Corporation. He declined to say at what price the stock had been sold or to name his associates or to tell how much P. & W. V. stock he retained. Colonel Colston said he was trying to show whether Mr. Taplin was representing himself or the Pennroad Corporation. Mr. Burnside said the commission would not issue an authorization unless satisfied of the independence of the applicant and of its ability to act upon an order of the commission but that he would not require the witness to state the amount of his holdings. C. F. Taplin, general counsel of the P. & W. V., said it expected to give the commission satisfactory assurances of its independence. Mr. Burnside overruled his objection to a question as to the price paid by the Pennroad but Mr. Taplin declined to answer on advice of counsel.

The Wheeling & Lake Erie had asked that President Atterbury of the Pennsylvania and President Lee of the Pennroad Corporation be subpoenaed to appear and submit data regarding the acquisition of the P. & W. V.

stock, but they had notified the commission that the information would be submitted voluntarily. C. B. Heiserman, vice-president and general counsel of the Pennsylvania, submitted some documentary data, including a copy of the charter of the Pennroad Corporation, and Mr. Lee was questioned at length by Andrew P. Martin, of counsel for the W. & L. E. He said the certificate for the 222,930 shares is still in the name of F. E. Taplin, but is held by the Pennroad, accompanied by a power of transfer. He said he had conducted the negotiations with Mr. Taplin and that he had reported the verbal understanding to his board of directors, but that there was no written record of it, except an "incidental office file." He said General Atterbury was not present at the time of the agreement and he did not recall whether he was present at the meeting at which it was reported. He declined to answer as to the price paid by the Pennroad and Mr. Burnside said he would not insist on it, although he said the commission is interested in its relation to the consolidation question and he wished Mr. Lee would furnish all the information he could as to the relations of the Pennroad Corporation. Mr. Martin noted an exception, saying he might wish to press the matter further.

Mr. Lee, asked as to whether there was any agreement as to the future management of the Pittsburgh & West Virginia, said there was not; merely an oral agreement to put the stock in Mr. Taplin's name and permit him to operate the property so long as he did nothing adverse to the interest of the Pennrod Corporation. He said there was no understanding at the time as to a resale of the stock but that within the past two or three weeks Mr. Taplin had asked if it could be returned to him and Mr. Lee had told him that the company would be willing, if he should be able to carry out his plans, and on terms that would be satisfactory. Asked where the Pennroad company obtained the funds for the purchase, Mr. Lee said that it had made an issue of additional stock and the voting trust certificates were offered to the shareholders. C. F. Taplin brought out that the Pennroad company under the agreement could not vote the P. & W. V. stock unless the management acted adversely to its interest but he said he assumed it would be the one to decide whether any act was adverse. Mr. Lee was asked whether the Pennroad Corporation owns any Lehigh Valley stock and when Mr. Burnside ruled that he need not answer he said: "Thank you."

H. H. Temple, chief engineer of the P. & W. V., T. E. Cannon, general superintendent of locomotives and equipment, and C. O. Dambach, superintendent, testified as to the economies that could be effected by operation of the two roads under single management. A. R. Kennedy, traffic manager of the Pittsburgh Steel Company, also testified that a single management of the two roads would result in improved service.

D. G. Gray, traffic vice-president of the Western Maryland, testified as to traffic relations between the P. & W. V., the W. & L. E. and the Western Maryland, saying that common control of the three companies would enable them to participate in a considerable amount of overhead traffic from which they are now barred.

Mr. Campbell submitted a long list of questions which the Pittsburgh Investment Company would like to have the P. & W. V. answer for the record, asking the price paid by the P. & W. V. for Wheeling stock, how much it proposes to pay Mr. Taplin for the 34 per cent held by him and associates, on what basis it proposes to provide funds for the purchase of additional Wheeling stock and details of the plan proposed for the acquisition by a new company of the roads in System No. 7 proposed to be acquired. He also asked regarding the progress made on the Connellsville extension, the cost, and whether the company had changed its views since its construction was authorized by the commission; also as to whether there is any delay in the construction of the Donora extension, which was opposed by the Pennsylvania. C. F. Taplin objected to the questions and Mr. Burnside reserved a ruling.

The presentation of evidence for the applicant was completed on June 17 and an adjournment was taken till the following day.

At the opening of the session on June 18 the Nickel Plate and the Wheeling counsel made a joint motion that the commission require Mr. Taplin and the Pennroad Corporation to state the price paid by that company for the P. & W. V. stock purchased from Mr. Taplin. Counsel for the P. & W. V. objected and Mr. Burnside indicated that the motion might be made the subject of argument before the commission.

* * * *

Descending the North Slope of the Cascade Mountains, on the Southern Pacific—Near McCredie Springs, Ore.

Further Hearings on "Reciprocity"

Testimony of western railway officers is taken at St. Louis and Chicago

COLLECTION of evidence by the Federal Trade Commission in the second of the government's "reciprocity" buying cases, that against the Waugh Equipment Company and certain officers of Armour and Co., shifted to St. Louis, Mo., on June 13, where testimony was taken from officers of the St. Louis-San Francisco, the Wabash, the Missouri Pacific and the Missouri-Kansas-Texas. A second hearing in the West was held at Chicago on June 16 and 17 with officers of the Chicago, Milwaukee, St. Paul & Pacific, the Chicago, Burlington & Quincy, the Chicago, Rock Island & Pacific and the Atchison, Topeka & Santa Fe as witnesses.

The traffic witness from each of the railroads whose representatives appeared produced statements regarding the amount of carload traffic originating from Armour and Co. and its subsidiaries and shipped over the respective roads. In only a few cases were these statements made a part of the record, for the most part being marked merely for identification. In the majority of cases the statement was furnished to the railroad by Armour and Co.

One of the first exhibits introduced as evidence at St. Louis was a letter written by A. J. Sams, a railway supply manufacturers' agent of Chicago, to B. T. Wood, vice-president and chief purchasing officer of the Frisco, on October 30, 1925. The letter, which was marked "Personal," was in part as follows:

"I made the argument that we should make the best price that we could to you, but my argument was met by the statement that we were not being considered for a sufficient number of cars to enable us to meet such a price as Miner could probably make you, considering the fact that he expects all or very nearly all of the 3,000 cars would be awarded him, and of course, it goes without saying that such reasoning was sound. I still think we may be given a sufficient number to enable us to make an acceptable price.

"For your personal information, Manager O'Brien, whom you met with some of your traffic officials last week, had the impression that we were scheduled for five hundred cars because of the traffic department's wish that we be given that number regardless of what additional number the mechanical department proposed to give us.

"I doubted the correctness of this information because I did not believe that another department would essay to intervene in a case of this kind, which I have always considered from a strictly mechanical standpoint.

"I had made the representation to Mr. Worman that our company did not propose to force an issue by any means and that I came to him in all sincerity to get his favorable recommendation in our case, but it now appears that the Equipment Company has thought that their traffic connection was sufficiently interesting to the Frisco to be used in our behalf."

Mr. Wood stated that he made no reply to this letter.

On November 30, 1925, Mr. Sams addressed another letter to Mr. Wood in which he said:

"I might say to you in confidence, that I think our people have definitely decided to abandon their old idea of trying to get draft gear business on any other plan than to handle direct with the purchasing and mechanical departments, and that they will work on the basis of selling as closely as is consistent with reasonable profit."

Draft Gear Bought by Frisco

Mr. Wood said that the Frisco made the first purchase of draft gear from the Waugh Equipment Company in 1926 when 100 sets were ordered. The next purchase was in February or March, 1928, 1,000 sets, while in 1929 the road ordered 2,801 sets. During the direct examination and the cross examination it was brought out that Mr. Wood was the officer designated by the Frisco management to consult with Frederick W. Ellis, vice-president in charge of traffic of Armour and Co., in regard to the procurement of traffic of that packer and its subsidiaries for movement over the railroad. The two were characterized as personal friends and Mr. Wood declared that any additional traffic that may have been given the Frisco after a conversation with Mr. Ellis in October, 1927, was upon a purely personal basis. He testified that he had never traded draft gear business with Mr. Ellis for additional traffic.

J. R. Koontz, vice-president of the Frisco in charge of traffic, showed that that road handled 756 cars of Armour traffic in September, 1927, and 735 cars, 601 cars and 550 cars, respectively in each of the three succeeding months. The packers claimed, Mr. Koontz said, that the Frisco fell down on its Florida and Birmingham service as opposed to the Louisville & Nashville. When the Frisco freight was late in arriving at Birmingham the L. & N. refused to hold its trains for the connection. But later the Frisco improved its schedules into Birmingham whereupon he wrote to Mr. Wood asking him to capitalize upon his relations with Mr. Ellis to regain some of the lost Armour traffic. Some of the Armour traffic was regained.

Favors "Reciprocity"

Mr. Koontz stated that ever since he became vice-president in May, 1922, the Frisco had followed a policy wherever possible, other things being equal, of "doing business with those who do business with us." Under cross examination he said that the failure of operation was more consequential in getting the packer traffic than any other factor. Upon a breakdown the traffic was immediately diverted to a competing road.

The first experience the Frisco had had with the Waugh gear was in 1907 when 100 stock cars were equipped with Types B48 and B49. In 1926, according to the testimony of H. L. Worman, superintendent of motive power of the Frisco, 100 cars were equipped with the Waugh spring-plate gear, Type S16G, which were not tested before they were purchased. In January, 1928, Mr. Worman visited the Waugh laboratory at Depew, N. Y., and spent a day testing the Type 402 gear. In the meantime he had opportunity to observe the performance of the gear on 100 freight cars on the Frisco. He expressed the opinion that the Types 400 and 402 had performed satisfactorily, and he so reported to his management.

After the Depew test Mr. Worman recommended the application of the Waugh gear to 1,000 cars. In the past the Frisco has used a great number of another make of gear, but no gear has been adopted as standard. During the consideration of the type of gear to be purchased J. M. Kurn, president of the Frisco, thought that 1,500 sets should be ordered from the Waugh company, but Mr. Worman testified that he was of the opinion that the total order should be for 2,500 sets so that all of that group of 50-ton box cars would be provided with the same kind of gear.

Wabash Correspondence Introduced

About 95 per cent of the carload traffic handled by the Wabash for Armour and its subsidiaries from 1925 to 1929 was competitive, W. C. Maxwell, vice-president of that road in charge of traffic, stated. On January 12, 1927, A. J. Pizzini, president of the Waugh Equipment Company, wrote a letter to Mr. Maxwell as follows:

"The specifications for your new cars mention Miner and Cardwell draft gear. The Waugh-Gould freight gear is not included. Our gear will equal, if not exceed, the performance of those specified. It costs about the same, interchanges without additional expense, and carries the same guarantees. We are anxious to get a start on your property. If you can without embarrassment assist us at this time, we would greatly appreciate it."

On January 14, 1927, Mr. Maxwell replied to Mr. Pizzini, stating:

"Your Mr. O'Brien called me on the telephone, also was in to see me this morning (unfortunately I was not in), and I suggested that he make some progress with the mechanical department and the purchasing department and possibly follow the matter up with Mr. S. E. Cotter, vice-president in charge of operation."

The Wabash purchased 500 sets of Waugh gear, Type 402, in the latter part of 1928, T. J. Frier, purchasing agent of the Wabash testified. The road required a guarantee, and the equipment maker guaranteed satisfactory performance of the gear providing that they were installed according to Waugh specifications. This the Wabash agreed to do.

The Waugh gear was not originally an alternate among the draft gear types in the Wabash bids in 1928 when 2,000 automobile cars were purchased, George F. Hess, superintendent of motive power of that road, said. Later, when the road asked for bids, the Waugh draft gear was included. Mr. Hess said that the Waugh gear was included because it was thought that bids should be obtained from all manufacturers of draft gear. Two tests of the Waugh gear were made, and inspection was also made of the gear on other roads. As a result a report on the gear made to the management on May 16, 1928, did not recommend its purchase.

G. E. Coutant, assistant to the superintendent of motive power of the Wabash, is charged with the responsibility for the preparation of specifications for the construction of freight and passenger equipment. In May, 1928, he investigated the use of the Waugh-Gould gear, Type 400, on the Chicago & Eastern Illinois. In October, 1928, he inspected the Waugh-Gould gear, Type 400A, in use on the Chicago & North Western; while at Chicago on August 21, 1926, and at Buffalo, N. Y., on September 1, 1928, he made laboratory tests of the Types 400 and 402, respectively.

Missouri Pacific Officers Testify

The first of the witnesses from the Missouri Pacific was C. E. Perkins, traffic vice-president, who presented a statement of carload traffic shipped by Armour and its subsidiaries over that road. It was presented merely for identification and was not made a part of the record, though Mr. Perkins did state that a large majority of it could be considered as competitive traffic.

The complete statement of the draft-gear purchases of the Missouri Pacific from 1924 to 1930, introduced by W. A. Hopkins, general purchasing agent of that road, showed that the following were purchased from the Waugh Equipment Company: In 1924, 700 sets of Type S16G and 200 sets of Type S15H; in 1925, 100 sets of Type S16G and 500 sets of S15H; in 1926, 250 sets of Type S16G and 2 sets of Type P24K; in 1927, 636 sets of Type S16G, 700 sets of Type S15H, 8 sets of Type P24K and 100 sets Type 400A; in 1928, 50 sets of Type 400; in 1929, 20 sets of Type P24K and 1150 sets of Type 400A, 1375 sets of Type 402, and 1935 sets of Type 403; in 1930, 19 sets of Type P24K, and 70 sets of Type 403.

Mr. Hopkins continued his testimony by stating that the chief mechanical officers of the Missouri Pacific and the general purchasing agent decide the allotment of car specialties and that L. W. Baldwin, president of the road, had nothing to do with the final decision. He described the blanket order arrangement which the Missouri Pacific has with draft gear manufacturers, through which the purchasing department anticipates repairs and replacements and provides the necessary gear to obviate delays in maintenance work. He referred to this as a definite order which is delivered only as required by the railroad.

Other witnesses of the Missouri Pacific included O. A. Garber, chief mechanical officer; S. O. Taylor, master car builder, and Thomas T. Railey, assistant general solicitor, who answered the subpoena for Mr. Baldwin, who was absent from the city.

Missouri-Kansas-Texas Testimony

G. E. Scott, purchasing agent of the Missouri-Kansas-Texas, testified that in January, 1930, that road purchased 500 sets of draft gear from the Waugh Equipment Company, supplementing that original order by a second one in April, 1930, for 100 sets. Mr. Scott said that when bids on cars and specialties have been obtained they are delivered to the president of the railroad, who makes the final determination of the allotment to the various manufacturers. He said that Mr. Pizzini first called at his office during the latter part of 1929, asking that the Waugh draft gear be considered by the Katy on its merits. Mr. Pizzini made the usual sales effort to sell this device.

After Mr. Pizzini's visit, the Waugh company was asked to bid on draft gear requirements, and Mr. Scott testified that the company would not have been included in the inquiries had its president not called. Mr. Scott said that the factors taken into consideration in the 1929 draft gear purchases by the Katy were serviceability and price. After the bids were shown to Columbus Haile, president of the Katy, Mr. Scott was instructed by him to purchase the Waugh gear, though he felt that it should first be tested.

H. M. Warden, chief mechanical officer of the Katy, declared that in 1929 he recommended three types of draft gear, one of which was the Waugh, as being suitable for that railroad's purposes. This was done following the American Railway Association tests at Purdue University.

Each of the witnesses appearing at the hearing was interrogated by the attorney for the respondent as to his acquaintance with Frederick W. Ellis, Arthur

Meeker, John B. Scott, and officers and employees of the Waugh Equipment Company. In each case where acquaintanceship with any of these men was admitted, the witness was asked whether additional Armour traffic had been promised by any of them in return for draft-gear purchases from the Waugh company and whether a threat had been made to withdraw Armour traffic in the event that no other purchases of Waugh draft gear were made. The answers were all in the negative.

Hearing Reopened at Chicago

When the hearing reopened at Chicago on June 16, testimony was first obtained from officers of the Milwaukee. H. E. Pierpont, traffic vice-president of the Milwaukee, testified that he had known Mr. Ellis for many years. In March or April, 1928, he had a telephone conversation with Mr. Ellis regarding Waugh-Gould draft gears. Mr. Ellis stated that he understood the Milwaukee was planning to purchase equipment and he wished that the road would buy Waugh-Gould gears for that equipment. Mr. Ellis further stated that he was interested in the Waugh Equipment Company and hoped that Mr. Pierpont would aid him in obtaining an order. Following that telephone conversation, Mr. Pierpont spoke to D. C. Curtis, chief purchasing officer of the Milwaukee, and expressed the hope that some of the Waugh gear could be purchased.

Shortly after the telephone conversation Mr. Ellis called at Mr. Pierpont's office, about April 6, 1928, and again urged that the Milwaukee purchase Waugh gears, mentioning the number of gears that were already in use by other railroads. At this point, a memorandum written by Mr. Pierpont to Mr. Curtis, and dated April 6, 1928, was introduced as evidence. The letter was as follows: "I have just had a call from Mr. F. W. Ellis of Armour and Co., who has left with me the carbon attached, of a letter addressed under date of April 2, by the president of the Waugh Equipment Company to Mr. Nystrom. The Armour people are immensely interested in this situation, and I hope before anything is finally done that we will have an opportunity of discussing the matter with you, as there seem to be many points involved and while, of course, I do not understand the technical features, still Mr. Ellis has a very reasonable explanation from that standpoint, and I do feel that the traffic involved is quite important."

The carbon copy which was attached to this memorandum consisted of a letter written by Mr. Pizzini to K. F. Nystrom, superintendent of the car department of the Milwaukee, on April 2, 1928. It consisted of a sales letter urging the purchase of Waugh draft gear and setting out a number of sales arguments. It included this paragraph: "You mention a willingness to recommend at least 325 car sets on the new cars under consideration. In view of the fact that you are purchasing 4,650 cars, we feel that the quantity of Waugh-Gould gears suggested would not be commensurate with the high quality of the product which we are offering you."

In 1928, out of a total order of 4,000 sets of gear, only 600 were purchased from the Waugh company, and at the same time 100 gear were purchased for renewals and repairs. Originally, Mr. Pierpont continued, the Milwaukee had in mind purchasing a smaller number than that.

In answer to the government attorney's question, "In your discussion with Ellis, was the purchase of a larger number than originally recommended a topic of discussion?", Mr. Pierpont replied, "I expect it was." Mr. Pierpont said that at no time in the conversations with Mr. Ellis was the latter satisfied with the number of gear that the Milwaukee proposed to purchase from the Waugh company. Mr. Ellis thought that the Waugh company was not obtaining a fair proportion of the total number to be purchased, and he was anxious that Mr. Pierpont assist him in any reasonable way. Mr. Ellis thought that the Waugh company would be allotted at least half of the total order. About March 4, 1929, Mr. Pierpont had further conversations with Mr. Ellis with respect to the purchase of draft gear, in which the latter urged that he be given assistance in obtaining an order for the gear for another lot of cars—about 5,400. At that time he also expressed dissatisfaction with the number that the purchasing department proposed to allot the Waugh company—about 500. In a telephone conversation with Mr. Pierpont some time during the spring of 1928, Mr. Ellis, in discussing draft gear purchases, mentioned that Mr. White, president of Armour, was interested in the Waugh Equipment Company.

The second witness from the Milwaukee was H. A. Scandrett, president, who testified that in 1928, while he had final authority in the determination of the firms from which purchases should be made, he usually exercised his authority through J. T. Gillick, operating vice-president. Mr. Scandrett recollected that he had had a conversation with Mr. Ellis and that the latter spoke to him in the interest of the Waugh draft gear. Mr. Scandrett also stated that in the ordinary course of procedure, he had probably told Mr. Gillick that Mr. Ellis was a good friend of the Milwaukee, and if the price and quality were right, he thought that they should have some orders for gear. He mentioned the fact that this same procedure applied to all equipment companies.

J. T. Gillick, operating vice-president of the Milwaukee, testified that the Waugh-Gould gear was not specified for application to cars purchased in 1928. It was first determined to use the Waugh gear in the spring of 1928. Mr. Pizzini had urged the purchase of the Waugh gear and Mr. Gillick agreed that the Milwaukee would purchase 250 sets. Later this was increased to 650 sets, the change being made because Mr. Ellis urged the purchase of more gear than was originally indicated to Mr. Pizzini.

Mr. Gillick said that the fact that the Waugh gear was being more generally used throughout the United States led to the recommendation that the Milwaukee purchase 750 sets of that type during 1929. In answer to the question of the government attorney, "Was that the only factor?" Mr. Gillick said that they also had in mind the interest that Mr. Ellis had in the gear. This interest was not brought to Mr. Gillick's attention by Mr. Ellis directly during 1929.

K. F. Nystrom, superintendent of the car department of the Milwaukee, testified that two tests have been made of the Waugh draft gear, one at Depew, N. Y., and the other at Chicago. As a result of the second test, Mr. Nystrom made a recommendation to Mr. Gillick based on the tests at Depew and at Chicago, but neither in 1928 nor 1929 did he make any recommendations as to the number of gear that were to be purchased from any one manufacturer.

A statement of the number of draft gear purchased for new equipment by the Milwaukee from the Waugh Equipment Company during the period from 1924 to 1930, was presented by D. C. Curtis, chief purchasing officer of that road. It showed that no Waugh gear were purchased in 1924, 1925, 1926, or 1927. In 1928 the Milwaukee purchased 650 sets of Type 402, in 1929.

the road purchased 850 sets of Type 402, and in 1930, 700 sets of the same type have been purchased.

Call Burlington Witnesses

On Monday afternoon the collection of evidence shifted to the Chicago, Burlington & Quincy, and Joseph R. Haynes, purchasing agent of that road, stated that in 1928 the Burlington purchased 50 sets of draft gear, Type 402, for freight cars, and 9 sets of Type P24K, for passenger equipment, from the Waugh company. In 1929, 250 sets and in 1930, 400 sets of Type 402 were purchased from the same company. During the same three years the Burlington purchased 1,584 sets, 1,250 sets and 1,110 sets respectively, of all gear.

Under cross-examination by the attorney for the respondent, Mr. Haynes stated that his acquaintance with Mr. Pizzini began about seven or eight months ago. At that time Mr. Pizzini told him that he wanted to sell draft gear on the basis of its price and its mechanical merit, and he wanted it understood, Mr. Haynes said, that a large order for draft gear would result in no more Armour traffic being allotted to the Burlington and that the failure to purchase Waugh gear would not result in the withdrawal of Armour traffic. Mr. Haynes also related that Mr. Pizzini had said that the stories of "traffic threats" had been spread by competitors of the Waugh Equipment Company.

On the Burlington the Miner draft gear is used as a base specification, Julius H. Reisse, mechanical assistant to the vice-president, testified. He said that the Waugh draft gear was specified by the Burlington as an alternate gear in 1928, 1929 and 1930. Before the purchase of any of the Waugh gear, the engineer of tests, F. Zeleny, and Mr. Reisse witnessed a test at the Waugh laboratories during the latter part of 1927, and following that test and correspondence with other railroads that were using the gear, it was placed in the Burlington specifications.

Rock Island Officers Testify

Frank A. Reed, vice-president and general purchasing agent of the Rock Island, stated that purchases of equipment of that road are made on the basis of a joint recommendation of the purchasing, operating and mechanical departments, although at times other departments are consulted. The Rock Island purchased 6,700 gear from the Waugh company from 1924 to 1930, at a total cost of $191,690. No freight-car gear purchases were made in 1924, 1925 or 1926. Later, gear were purchased from the Waugh company as follows: 1928, 12, for repairs; 1929, 2,500 Type 403, 500 of which were for rebuilt cars and the remainder for new box cars; and 1930, 4,000 Type 403, for new box cars. Under cross-examination, Mr. Reed stated that the Rock Island purchased, from all equipment companies, 7,740 gear in 1927, 3,588 gear in 1928, 7,657 gear in 1929 and 11,437 gear in 1930. Purchases of Waugh gear for passenger equipment were as follows: 1926, 10; 1927, 8, Type P10E; 1928, 20, Type P10E; 1929, 30, Type P10E, and 14, Type P24K. He also stated during the direct examination that representatives of the Rock Island made a test at the Waugh laboratories at Depew on November 30 and December 1, 1927, and afterward reported to Mr. Reed that the gear were satisfactory.

The test at Depew was made by George S. Goodwin, assistant to the general superintendent of motive power of the Rock Island, who was instructed to go there by L. A. Richardson, general superintendent of motive power of that road. Mr. Goodwin testified that he planned to make the trip pursuant to a memorandum sent to Mr. Richardson by L. C. Fritch, operating vice-president of the road. He was instructed by Mr. Fritch's office to obtain the details of the test from Arthur Meeker, which he did over the telephone. Arthur Mackenzie, vice-president and freight traffic manager of the Rock Island, presented a statement of Armour traffic handled by the Rock Island Lines, stating that a large majority of it was competitive business.

Sante Fe Tested Waugh Gear

Charles T. Ripley, chief mechanical engineer of the Santa Fe, stated that in conjunction with three other railroads, the Santa Fe made a test of the Type S16R in 1926. The test was made from the laboratory standpoint to demonstrate all features of the gear to indicate its service performance, and included determinations of its capacity, sturdiness, durability and uniformity of action. Nine types of gear were subjected to tests ranging over a period of eight months.

The report of the tests which Mr. Ripley presented to his superior officer, J. Purcell, assistant to the vice-president, set forth the conclusion that the Waugh gear tested at that time rated 48.6 per cent in comparison to the National, Type M17, which was used as a base. In this test all the gear were tested to failure. Because the test was merely for information Mr. Ripley made no recommendations for its use or rejection by the Santa Fe. The Waugh gear rated 70 per cent on capacity, 60.6 per cent on sturdiness and 18.5 per cent on endurance. Mr. Ripley said that the Santa Fe considered the Waugh to be a gear of too low capacity for its freight requirements.

Later another test of Waugh gears of Type 400A and 402 were made at Depew.

The first test on Type 402 at Depew was abandoned because of breakage of the wedges of the gear, Mr. Ripley testified. The conclusion was made that the breakage was the result of an error in the foundry methods, and after the manufacturer showed a foundry correction a new test was made by the Santa Fe. After the latter test the gear was found to be satisfactory and Mr. Ripley recommended its use on the Santa Fe.

E. G. Walker, assistant general purchasing agent of the Santa Fe, appeared in place of M. J. Collins, general purchasing agent, who was unable to be present because of illness. Mr. Walker stated that in 1924 no competitive bids were taken by the Santa Fe on draft gear. In 1925 two manufacturers were asked to bid, while in 1926 the inquiry list was increased to include several more manufacturers. For repairs to equipment the road asks for no competitive bids for draft gear. The Waugh gear was not specified in 1925 or 1926, but in 1926 it was placed in the specifications for new equipment as an alternate.

The first Santa Fe purchase of draft gear from the Waugh company was in 1926, Mr. Walker stated. The purchases from that company in the next few years were as follows: In 1927, 25 sets, Type 400, for a road test on sulfur cars, and 47 sets, Type P24K, for passenger cars; in 1928, 38 sets, Type P24K, for passenger cars, and 10 sets, Type P24K, for locomotive tenders; in 1929, 425 sets, Type 402, for gondola cars, and 30 sets, Type P24K, for passenger cars; in 1930, 500 sets, Type 402, for automobile cars, and no gear for passenger cars. Replacements ordered from the Waugh company consisted of three sets, Type P24K,

and one and one-half sets, Type S16G, for passenger cars in 1927; one set, Type P24K, for passenger use in 1928; and 90 sets, Type P24K, replaced by the manufacturer at a nominal charge, and 10 sets, Type S10G. Mr. Walker stated that the 90 replacements were ordered because the mechanical department had advised that the gear were wearing out, and that the replacement of these gear was still taking place.

Total purchases by the Santa Fe of draft gear from all manufacturers have been as follows: In 1927, 91 passenger sets and 3,200 freight sets; in 1928, 5,000 freight sets and 76 passenger sets; in 1929, 4,775 freight sets and 58 passenger sets; in 1930, 5,804 freight sets and 49 passenger sets. In reply to the government attorney's question as to the attitude of the Santa Fe on traffic and purchases, Mr. Walker declared that "Naturally we anticipate trading with our friends."

Introduce Correspondence with Arthur Meeker

The last witness on June 17 was John W. Cooper, chief clerk to the president and the executive vice-president of the Chicago, Burlington & Quincy. He produced the office files of correspondence of those two officers, and his testimony served to introduce a number of items of correspondence as evidence.

The first exhibit in this group was a letter written by Arthur Meeker, vice-president of Armour & Co., on June 23, 1927, to Hale Holden, who was then president of the Burlington. As a letter of introduction it stated:

"The bearer of this letter, Mr. A. J. Pizzini, is the president of the Waugh Equipment Company, in which some of your very good friends are interested. I wanted Mr. Pizzini to know you and I am sure you can be helpful to him."

Mr. Holden answered this letter from Mr. Meeker on the same date as follows:

"I was very glad to meet Mr. Pizzini this morning who brought your letter, and to talk over this matter. I shall be glad to take an interest in informing myself further and I hope something of mutual interest may be developed."

Later in 1927, on December 19, Mr. Meeker wrote another letter to Mr. Holden, in which he said, "I understand a representative from your mechanical department was at our laboratory at Depew the other day investigating the Waugh draft gear and would be very glad to know if we are in a position to bid on any of your requirements now." Mr. Meeker also mentioned that while he expected to leave the city Mr. Holden's reply would be given to Mr. Ellis.

Mr. Holden replied to Mr. Meeker on December 30 in a letter which was as follows:

"The importance of the draft gear is principally to determine how it will stand up under service, and naturally our mechanical people are compelled to be conservative when it comes to considering a change, particularly when the type which we have been using has been found satisfactory under continuous service experience. We are interested, however, in the recent improvements that have been made in the Waugh gear, and I have arranged for a substantial test to be made when we are next in the market for an additional supply. With this we will be able to determine how it stands up under service, and I am hopeful it may afford us a basis for further use of it."

A third letter was written to Mr. Holden by Mr. Meeker, on February 27, 1928, as follows:

"Fred Ellis told Ed White and me this morning that we had received about one-third of your orders, some 135 cars, for our draft gear, and we are all very grateful to you, as this is the first time, as I understand it, on your road. I understand you are buying seven passenger cars, which have not yet been let. I suppose you know that our Waugh draft gear is standard with the Pullman Company, and, in general, with most of the railroads for passenger cars. For instance, the Pioneer Limited advertises roller bearings and Waugh gears. They have been found by everybody to be the most comfortable gear that is made, and cost only $10 to $12 per set more than the ordinary gear for freight cars. Eighty per cent of all the passenger cars that were built last year were equipped with them, and, although you are only buying a few cars, we would be very glad to have them on your line."

Mr. Holden replied to the foregoing letter on February 28, the following day, and said:

"The seven passenger cars to which you refer were let last week to the Pullman Car & Manufacturing Co., and in accordance with understanding which Mr. Burnham had with Mr. Ellis sometime ago we have asked for bids on your gear which we are expecting within the next few days, after which they will be given careful consideration in connection with other bids, and as soon as we reach a conclusion I shall be very glad to write you further. We have been very glad to make application of the Waugh gear to the portion of the recent freight equipment ordered and shall observe the test with much interest."

Other witnesses at Chicago were Richard Hackett, general traffic manager of the Central Manufacturing District, Chicago, and formerly western freight traffic manager of the New York, New Haven & Hartford; F. H. Hammill of the Western Train Service Adjustment Board, Chicago, and former assistant general manager of the Chicago & North Western; and J. H. McCave, assistant freight traffic manager of the Santa Fe. Each of these officers, as well as all the other officers who testified at Chicago, were asked by the attorney for the respondent as to their acquaintanceship with Mr. Meeker, Mr. Ellis, Mr. Scott and any officers or employees of the Waugh company. In each case the reply to the questions as to promises of additional traffic or threats of withdrawal of traffic in the event of purchase of or failure to purchase Waugh draft gear was in the negative.

Stockholders in Waugh Equipment Company

At one of the early hearings Carl F. Ehrlich, secretary of the Waugh company, presented a statement showing the outstanding capital stock of the Waugh Equipment Company as of May 1, 1930. The number of shares of preferred and common stock, with the holders, was as follows:

Wait Talcott, 72 preferred and 8 common; E. E. Bolte, 7 preferred and 10 common; R. A. Bolte, 10 common; C. L. Bolte, 7 preferred and 10 common; H. V. Conine, 37 preferred and 40 common; Harold F. White, 25 common; Mrs. E. H. M. Hall, 43 preferred and 25 common; A. D. Curtis, 15 preferred and 22 common; A. J. Pizzini, 333 preferred and 2,291 common; J. M. Waugh, 1 common; International Business Machine Company, 390 common; C. J. Faulkner, Jr., 100 common; J. J. O'Fallon, 150 common; Whitehouse Investment Company, 1,000 common; R. M. Schucker, 1 common; Marjorie B. Reynolds, 100 common; Arthur Meeker, 57 preferred and 1,069 common; Etta L. Ellis, 1,069 common; George A. Hood, trustee, 1,666 common; Celeste K. Scott, 409 common; R. J. O'Brien, 100 common; A. L. Bolte, 121 preferred and 170 common.

The hearing adjourned on June 17, to allow railway officers and other prospective witnesses to participate in the American Railway Association convention at Atlantic City, N. J., and will reconvene at Chicago on June 26.

Compromise on Couzens Resolution Considered

WASHINGTON, D. C.

A COMPROMISE substitute for the Couzens resolution to suspend the powers of the Interstate Commerce Commission to authorize railway unifications was being considered by the House committee on interstate and foreign commerce during the first part of the week. A sub-committee was appointed on June 17 to draft a revision of the resolution as it was passed by the Senate, with a view to arriving at a substitute for the complicated patchwork of proposed temporary legislation concocted by the Senate committee which might be accepted by the committee without hearings, and the sub-committee was to report back to the full committee on June 19. Although the House committee has been unwilling to accept the Senate measure without hearings, and the time before the prospective adjournment of Congress seemed too short to hear advocates of both sides, it has been under tremendous pressure to take some action from the Representatives of the northwestern states opposed to the Great Northern Pacific unification and from the railroad labor organizations, whose influence is more than usually potent in an election year. The appointment of a sub-committee was decided on at a meeting on June 17 after the committee had heard expressions of the views of the commission in executive session from Chairman McManamy, who is in favor of the Couzens resolution, from Commissioner Porter, who is opposed to it, and from Commissioner Eastman, who desires to put a stop to the activities of holding companies but is not in accord with some of the provisions of the resolution.

Some of the members of the House committee are understood to feel that something should be done before Congress adjourns but to be unwilling to accept all the provisions of the Couzen's resolution, especially as there is considerable doubt as to how much it means. No statement was made public as to the basis on which the sub-committee was working but since most of the pressure for the resolution has come from the opponents of a combination of the Northern lines it was thought than an effort might be made to obtain at least the adoption of a simple resolution that would prohibit the commission from taking further action in that case until Congress had had a further opportunity to consider consolidation legislation. Such a suggestion was made by certain members of the Senate committee during the hearings before that body when the statement was made that the resolution could not be put through the House. Although the belief has become rather general that there is little likelihood of the commission's being called upon to take any further action in that case in the near future, the Minnesota Representatives in Congress have been redoubling their efforts to attach some credit to themselves for preventing the unification since it began to appear that the railroads themselves would be unwilling or unable to comply with the conditions imposed by the commission, which would require the Northern lines to give up their control of the Burlington as the price of the commission's authorization.

The sub-committee consists of Chairman Parker of the House committee and Representatives Mapes, Hoch, Denison, Rayburn and Huddleston.

The Minnesota Congressmen also have been trying hard to induce the Interstate Commerce Commission to indicate that it would be governed by the Couzens resolution even in the absence of the formality of its passage by the House, to say nothing of the signature of the President. On June 6 they addressed a letter to Chairman Parker urging the desirability of holding hearings on the resolution, or at least of beginning hearings, "so as to serve notice upon the Interstate Commerce Commission that the matter is receiving the earnest attention of Congress and that no further action should be taken by the commission until Congress shall have had an opportunity to conclude its study of this very important subject."

The Minnesota delegation, together with Representatives from other states interested in the Great Northern Pacific case, also have been working on the commission. Some time ago a committee of Representatives from seven northwestern states called on Chairman McManamy and requested that the commission refrain from giving assent to the Great Northern Pacific application until the subject can be further investigated by Congress, although the House committee has been working on proposed legislation to amend the consolidation provisions of the transportation act for several years. Later the Minnesota delegation made public a letter addressed to Chairman McManamy quoting from his reply to the committee as follows: "You state that the commission takes the view 'that as long as laws providing for the consolidation of railroads remain on the books, we must continue to administer them in accordance with their provisions, therefore we cannot consistently respond affirmatively to your suggestion that we delay action upon this consolidation in anticipation of the enactment of further legislation.'" To this the delegation replied:

"Surely, Mr. Chairman, your commission must be aware of the intent of Congress to legislate upon this very important phase of the transportation question. Indeed, the Senate has already passed the so-called Couzens resolution which is now before the interstate and foreign commerce committee of the House but probably can not be acted upon during the present session of Congress for lack of time. The Senate, by its action, has indicated its position and the House will probably take similar action at the short session of Congress.

"Do you not believe that under the circumstances the application of the Great Northern and Northern Pacific railroads to merge should be held in abeyance until Congress reconvenes in December, when the subject matter will again be considered? We believe that in view of the action already taken on the Couzens resolution, your commission could very properly refrain from acting upon applications of parallel and competing railroads to merge until Congress has had an opportunity to act. We sincerely hope the commission will reconsider its determination as communicated by you on June 7."

The House committee failed to assent to the request of the Minnesota Representatives to the extent of holding public hearings but it assisted in keeping the subject alive for a while by hearing from members of the commission in executive session. Commissioner Eastman appeared before the committee on June 12 and Chairman McManamy and Commissioner Porter appeared before it on later days.

When some of the members of the Interstate Commerce Commission were before the Senate committee they were asked by several Senators if they would be governed by a Senate resolution requesting them to hold up approval of the Great Northern Pacific or other unifications, if the House should fail to act. The polite reply was that any request from the Senate would

View of Fez City, the Canadian Pacific's Temporary Yard Constructed at Toronto for the Accommodation of Parked Sleeping Cars During the Shrine Convention

of course be given respectful attention but that the commission was supposed to be governed in its actions by law.

The Senate passed on June 16 without a word of discussion the Senate resolution introduced by Senator Couzens last week to authorize the committee on interstate commerce or a sub-committee to make an investigation and report on the matter of consolidation and unification of railroad properties and the effect of them upon the public interest, at an expense of not over $5,000. The report is to include such recommendations for legislation as the committee deems advisable. It is understood that the committee has no intention of making a formal inquiry or of holding hearings this summer but that Chairman Couzens desires to have a study of the subject made for the committee by William C. Green, who has been serving as an expert for it in connection with proposed legislation on communications and power.

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Main Entrance to the Wilson Station, Prague, Czechoslovakia

Canadian Railways House 14,500 in Parked Sleepers

THE Canadian National and the Canadian Pacific accommodated 14,500 persons in parked sleeping cars during the meeting of the Imperial Council of the Nobles of the Mystic Shrine at Toronto, Ont., on June 9, 10, 11, and 12. The Canadian National utilized a coach yard for the storing of 375 Pullman cars, while the Canadian Pacific constructed a new yard with a capacity of 280 cars for this purpose, both of which were located in the business section of Toronto, conveniently near to the exhibition grounds where the sessions of the Shrine were held.

The Canadian Pacific yard, known as Fez City, was located on a 21-acre site, near the intersection of Fleet and Bathurst streets, and included in addition to the 32 yard tracks, wooden platforms, two paved roadways and a shower building for bathing, which had outside dimensions of 220 ft. by 20 ft. The yard was floodlighted, and all cars were provided with a water supply and sanitary facilities. Restaurants, telegraph and telephone service, barber shops, beauty parlors and similar accommodations for a temporary community were provided at the yard.

At the Canadian National yard, which was named Temple Park, a two-story commissary building was fitted out as a headquarters for the Shriners. Its facilities included rest rooms, barber shops, tea rooms, a beauty parlor, a post office and a telegraph and telephone station. Temple Park proper accommodated 250 cars and an annex was used to store 125 more cars. A loop was constructed at Temple Park to permit the placing of incoming trains on their assigned tracks, ready for the outward movement, with the use of the road locomotives.

The movement to Toronto began on June 7 and 8 and reached a maximum on June 9. Departures on the Canadian National began at 7:30 o'clock on the evening of June 12 and continued until 10 o'clock on the following morning. In that interval 39 special trains were dispatched from their parked locations.

THE NIZAM'S GUARANTEED STATE RAILWAYS (India), consisting of 492 miles of 5 ft. 6 in. gage line and 610 miles of 3 ft. 3⅜ in. gage, were to be taken over by the Nizam's government on April 1 of this year, according to Commerce Department reports.

Looking Backward

Fifty Years Ago

The Supreme Court of Illinois has rendered a decision affirming the judgment of a lower court as to the constitutional power of the state legislature to enact a law providing for the establishment of a schedule of reasonable maximum rates for railways within the state and otherwise authorizing the state regulation of railways.—*Railway Age,* June 24, 1880.

The stockholders of the Chicago & Strawn, meeting at Chicago on June 22, authorized the consolidation of that road with the Wabash, St. Louis & Pacific [now the Wabash]. The Chicago & Strawn was constructed by the owners of the Chicago & Paducah, the Wabash purchasing the latter on the condition that it would construct the line from Strawn, Ill., to Chicago, 99 miles.—*Railway Age,* June 24, 1880.

Upon the moot question as to whether it is more profitable for railway companies to conduct their own express, fast freight and sleeping car business, opinions of managements differ widely. The president, directors and leading stockholders of the Northern Pacific have adopted the policy of freedom from all intermediate interests, and have taken every branch of traffic under their own charge. This includes not only express freight lines, package express business on passenger trains, sleeping and parlor cars, but also the construction, operation and ownership of grain elevators.—*Railway Age,* June 24, 1880.

Twenty-Five Years Ago

The eighteen-hour train between New York and Chicago, the Twentieth Century Limited, made its first run on June 18. The first trains run at the increased speed were reported as much as 20 minutes ahead of time at some division terminals on that road. The trains on both the Pennsylvania and the New York Central have only four cars.—*Railroad Gazette,* June 23, 1905.

C. H. Ewing, division engineer of the Philadelphia & Reading [now the Reading] at Reading, Pa., has been appointed engineer maintenance of way of that road, a new office. J. M. Davis, division superintendent of the Great Northern at Larimore, N. D., has been appointed assistant general superintendent of the Central district of that road.—*Railway Age,* June 23, 1905.

The contest in Wisconsin over the creation of a railroad commission with authority over rates has ended. The bill which Governor La Follette signed on June 13 gives the railroad commission rate-reviewing but not primary rate-making powers. Governor La Follette attached a memorandum to the bill in which he expressed regret that it did not contain a provision authorizing the commission to deny railroads and other public service corporations the right to issue stocks and bonds without first providing the commission with a statement of the property valuation of the company.—*Railroad Gazette,* June 23, 1905.

Ten Years Ago

The transportation situation still remains acute in practically all of the larger terminals in the West and Middle West. In spite of efforts of the Interstate Commerce Commission, the problem of shipping essentials and non-essentials is no nearer solution.—*Railway Age,* June 18, 1920.

The Grand Trunk and the Canadian National are being made into a single organization as rapidly as possible. Consolidation of dual offices at various points has already been decided upon. Combined through passenger services have been authorized, effective June 27, between Montreal and Sudbury, with triweekly service to Winnipeg, and between Toronto and Winnipeg, connecting at the latter point with daily trains between Winnipeg and Vancouver.—*Railway Age,* June 18, 1920.

New Books

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Bulletin No. 22 of the Railway and Locomotive Historical Society. Includes "The Genesis of the Western R. R." [Massachusetts], by H. A. Freeman, "Boston and Albany Locomotives 1832-1930" by G. P. Becker and C. E. Fisher, "The Montreal Ice Railway 1880-1881," by Robert R. Brown, "A Brief History of the New York and New England R. R." by G. M. Woodruff, a note of the Liverpool and Manchester Centenary, and other articles of historical interest. 62 p. Pub. by The Society, Boston, Mass., $1 to Members; $2 to Non-Members.

Inland-Waterway Freight Transportation Lines in the United States, by L. P. Nickell and W. S. Abernathy. Lists 478 inland-waterway freight lines with description of services, traffic, and principal commodities handled, and rail line with which company has joint rates. 147 p. Map. Domestic Commerce Series No. 32. Pub. by U. S. Govt. Print. Off. Washington, D. C. 30 cents.

Railways of South America, Part III: Chile, by W. Rodney Long. The Introduction includes an outline of the organization of the government, finances, commerce and industires, and transportation generally. The railway equipment market is discussed and the history, organization, finances, etc. of the individual railways. The Chilean Railway Law of 1925 is to be found in the Appendixes, together with "Rail Material Specifications" and tables of imports or railway equipment into Chile by articles and countries of origin. 373 p. Map and illustrations. Trade Promotion Series No. 93. Pub. by U. S. Govt. Print. Off., Washington, D. C., $1.30.

Report No. 11 of the Commissioner for the German Railways, May 10, 1930. Report for the calendar year 1929 signed by the Commission, Gaston Leverve. "Annexes" contain list of members of the managing board of the German Railway Company, "Service of Reparation Bonds," "Payment of the Transportation Tax," operating statistics, and other statistics, and the Law of 1924 with amendments inroduced by Law of March 13, 1930. Summary in Modern Transport, June 7, 1930, p. 5-6. 157 p. Pub. by Commissariat for the German Railways, Berlin, Germany.

Periodical Articles

Alloy Steels in Modern Locomotives. "It would seem that the ultimate capacity of the modern locomotive depends only upon the limitations of the pulling and buffing forces which freight car construction will withstand." p. 115. Vancoram Review, July, 1930, p. 113-115.

Improvements on the Pennsylvania Railroad, by Paul T. Warner. Electrification, new Broad Street Station Building, new coal pier and dumpers, produce terminal, and other improvements at Philadelphia. Illustrated. Baldwin Locomotives, July 1930, p. 2-18.

Modern American Passenger Locomotives, by H. A. F. Campbell and Paul T. Warner. The K4s of the Pennsylvania, the Hudson Type of the New York Central, the 4-8-4 Type of the Lackawanna, 4-6-4 and 4-8-4 Types of the Santa Fe, the Class S-1 and Class S-2 locomotives of the Great Northern, the Class M-64s of the Denver & Rio Grande Western, the Class S-1s and F-6s of the Chicago, Milwaukee, St. Paul and Pacific, and the Class Hs of the Chicago & North Western, are described and illustrated. Baldwin Locomotives, July 1930, p. 53-70.

Observations of a Baldwin Engineer in Siam, by H. G. Burall. ". . . trains which are unsurpassed in comfort, convenience and smooth riding . . . " A generously illustrated and unusual description of a country and its railways. Map, p. 20. Baldwin Locomotives, July 1930, p. 19-37.

Odds and Ends of Railroading

This Joke is Obsolete

An eastern railroad that has recently inaugurated a new limited passenger train effectively squelches one source of jokes for the perennial railway wag. In current descriptions of the new train is the terse announcement that the cars are furnished with windows "that will open."

Tango Champions

Jack Barrett, traveling car agent for the superintendent of transportation of the Missouri Pacific, apparently became graceful and fleet of foot in chasing cars. With Miss Eleanor McCarthy of the car accountants' office as a partner, he won first prize in the tango contest recently held in St. Louis.

Army Blimp Removes Mail Sacks From Top of Pennsylvania Flyer

Four mail sacks on top of a Pennsylvania train speeding at 55 miles an hour were successfully removed by an army blimp at Lakehurst, N. J., in an experiment to speed up mail parcel deliveries. After two weeks of such tests, the army airship C-41 caught with light grappling hooks the sacks on top of the Pennsylvania train, the first such contact between a passenger train and an airship to be successful.

Carry Honored

A belated but deserved recognition has been awarded to Vice-President Champ Carry, of the Pullman Car & Manufacturing Corp., in the form of a Distinguished Service Cross. During the World War, Mr. Carry was a lieutenant in the 18th Field Artillery, Third Division. The citation for which the decoration was given, reads as follows:

"Lieutenant Carry, assisted by another officer, carried a wounded man under fire to a place of comparative safety, from where the soldier was evacuated to the rear. The utter disregard for his own safety displayed by Lieutenant Carry was an inspiration to the entire command."

European Stations

The American traveler arriving in Prague, capital of Czecho-Slovakia, is generally surprised to discover that the name of the main station is President Wilsonavo Nadrazi, in honor of the war-time president of the United States.

For really bizarre effects, the station at Ulm in southern Germany takes the prize. This large and commodious station is painted a bright green, with lilac borders around the doors and windows.

In deference to the fact that Austria is now a republic, they have painted the word "Emperor" from the name of the main station at Vienna, and it is officially "The Franz Josef Bahnhof."

Still More Youngsters

J. A. Klos of the Buffalo, Rochester & Pittsburgh, we have found, is not the only young veteran in railway service. On the Northern Pacific are at least four young men with enviable service records. Frederick L. Carlton, chief interline clerk in the auditor of passenger receipts' office, was born July 13, 1895, and entered the Northern Pacific service March 14, 1910. Being less than 34 years old, he has 20 years of continuous service to his credit. Charles F. Isaak, assistant general bookkeeper, who is 36 years of age, entered the service of the company on September 6, 1907 and has had 22 years and 8 months of continuous service. William J. McCauley, train auditor in the auditor of passenger receipts' office is 57 years old, with 42 years of continuous service. Thomas H. Fifield, 59 years old, special accountant, entered the Northern Pacific service in October, 1886, and has 44 years of service to his credit.

River Crossings and Tunnels

NEW YORK.

TO THE EDITOR:

Now that the records of numerous crossings of a single stream have been laid bare, the following is offered as a possible record of some kind or other:

On the Kettle Valley, a Canadian Pacific line in British Columbia, there are three crossings of the Coquihalla river and four tunnels within less than a mile—and all on one tangent! I was employed as a resident engineer in charge of the construction of a portion of this railway, 15 or 20 years ago, and these particular tunnels were on the section adjacent to mine in the Coquihalla canyon about six miles from Hope station. The canyon narrows to a gorge at this point, too crooked for the railway to follow. Each tunnel is joined to the next by a steel span, there being practically no intervening cuts or fills. Immediately east of these tunnels the railway ascends 3,000 ft. in a distance of 50 miles.

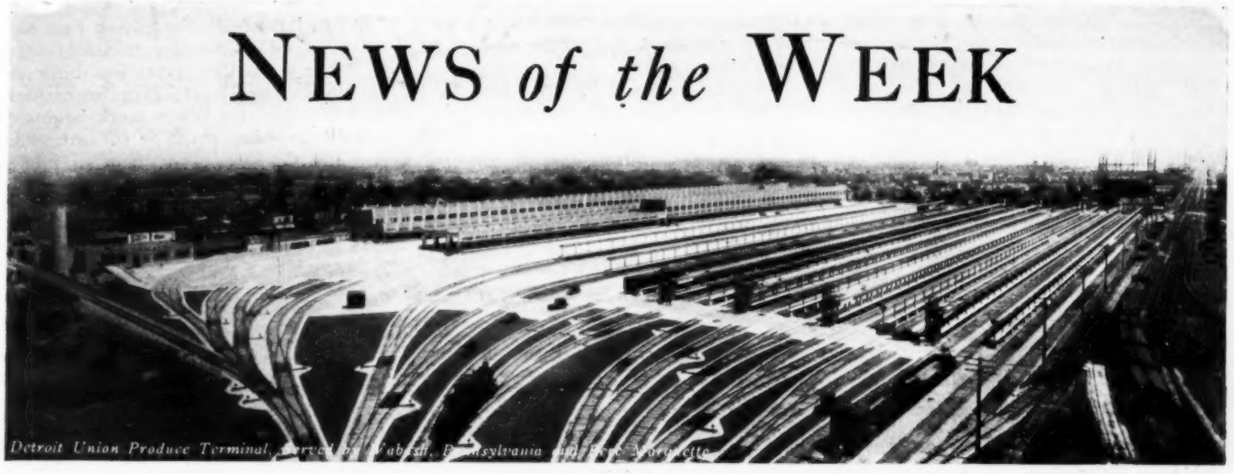
Looking Through Two Tunnels from the Mouth of the Third

The accompanying illustration shows a typical crossing location looking from the mouth of Tunnel 13 across the river to Tunnel 12. The opening between Tunnel 12 and Tunnel 11, across the canyon again, can be faintly seen in the picture. At this time access could be had to the work by ropes, ladders and cable cars only.

Last summer I had the pleasure of returning and riding over this line in an observation car of the Kootenay Express. Most of the old construction force, I found, is now operating the railroad. It is a country one does not like to leave.

H. W. FAUS,
Engineer of Tests, New York Central.

NEWS *of the* WEEK



Detroit Union Produce Terminal, served by the Wabash, Pennsylvania and Pere Marquette

THE INTERSTATE COMMERCE COMMISSION has denied the petition of the American Railway Association for a rehearing or reargument or modification of the commission's findings issued following its investigation of the rules for carhire settlement.

THE HEARING on the Oregon-Washington Railroad & Navigation Company's petition to enjoin the Interstate Commerce Commission from forcing the construction of a branch line from Crane, Ore., to Crescent Lake, 185 miles, will be held at Portland, Ore., on June 30 before Judge Frank H. Rudkin of the United States Circuit Court of Appeals.

TWELVE LOCOMOTIVE ENGINEMEN of the New York, New Haven & Hartford have their portraits printed in the May issue of the company's magazine, the occasion being the receipt of comments from passengers on the smoothness with which the through night trains between New York and Boston are managed by these enginemen. It appears that passengers in the sleeping cars who happen to wake up in the middle of the night have difficulty in deciding whether or not the train is in motion, so easily do the cars ride. These enginemen are: E. G. Annabel, C. E. Benedict, R. A. T. Bitgood, M. F. Carver, A. B. Colbath, A. T. Curtis, D. J. Hayes, D. C. Horton, F. A. Longley, M. F. O'Brien, F. B. Pomeroy and A. W. Smith.

Yankee Clipper Pictures

Fourteen paintings of famous clipper ships which are to be hung in the cars of the "Yankee Clipper," the new New York-Boston train of the New York, New Haven & Hartford, are to be on public exhibition at the Grand Central Art Galleries, 15 Vanderbilt Avenue, New York City, on Tuesday, June 24, and the four following days.

Mr. Arehart's Unusual Record

Thomas B. Arehart, engineman on the Cincinnati Division of the Pennsylvania, who runs express train No. 66 from Indianapolis, Ind., east to Columbus, Ohio, has made schedule time on every trip since he was assigned to this run, on April 30, 1928. On some days he has received the train late but has made time, or better, on his division. The length of this run is 181 miles and the time three hours, 55 minutes, making the average speed 46 miles an hour. No. 66 is "The American," the fastest train on the division. Mr. Arehart is 68 years old, and his portrait is given in the Pennsylvania News holding in his arms his great granddaughter, Marilyn Elizabeth Jones, 13 months old.

Safety Program for July

The Safety Departments of American railroads are expected to devote the month of July to the cultivation of safe habits on the part of shippers and receivers of freight. The Safety Section, A. R. A., issues no circular at this time but has prepared for the use of the roads a large colored poster calling upon shippers who load or unload cars at their plants, to take care to clean all cars when unloaded. This exhortation is illustrated by a picture showing where a heavy piece of machinery has been taken from a flat car without attention to the blocking; and a large timber is left on the car in a position liable to injure a brakeman walking on the ground near the track.

Canadian Shop Crafts Seek 40-Hour Week

Division 4, American Federation of Labor, meeting at Winnipeg, Man., June 2, adopted resolutions similar in intent to those drafted by the recent meeting of the railways department of the same organization at Chicago. The program, which the Canadian shop crafts will endeavor to get adopted, includes the 40-hour week, with no reduction in wages, a reduction of the number of apprentices and lengthening of their period of apprenticeship, the gradual elimination of helpers, two weeks' holiday with pay, employment of a minimum force for at least one year and the establishment of a reserve of shop work to provide employment for a minimum force during periods of depression. Members of the Canadian National branch of the division endorsed the union management co-operation program of the National Railways and urged the establishment of local union committees for the solicitation of traffic.

B. L. E. Convention

The Brotherhood of Locomotive Engineers at the early sessions of its triennial convention, which opened at Cleveland, Ohio, on June 2, indorsed the Couzens resolution providing for the suspension of the consolidation of railroads and the Cooper bill providing for salary increases to Interstate Commerce Commission inspectors, both now pending before Congress. The legislative committee of the brotherhood urged the reduction of the maximum hours of continuous service under the Federal law from 16 to 12. It was also recommended that the organization favor an amendment to the Railway Labor Act providing that regional train-service boards be given jurisdiction over all cases that are presented to them, even to the extent of reversing decisions in discipline cases, where the discipline seems excessive. The brotherhood took no action on the proposal of the Order of Railroad Conductors that the two bodies be merged.

General Electric to Stabilize Employment

The General Electric Company announces the adoption of an "unemployment plan" designed to aid employees when business is slack. The money will be raised through equal contributions by the employees and the company. Any one of the company's numerous plants may adopt the plan regardless of the action of other plants. Adoption at any plant depends on a 60 per cent vote of employees at that plant; all employees who have been in the service one year. An employee must agree to contribute one per cent of his earnings so long as he earns 50 per cent of his normal pay. In case of abnormal times of unemployment, normal contributions would cease and all employees would be called upon to contribute.

Provision is made for contributions to

a relief fund and a fund for lending to employees, as well as for ordinary unemployment payments. In each plant the management will be by a board of from four to sixteen members, half of whom will be appointed by the company. Contributions must be made for six months before benefits will begin to be paid.

On a temporary lay-off, an employee will receive 50 per cent of his average earnings but not more than $20. a week; and for not over ten weeks in any 12 consecutive months.

Provision is made for unemployment emergencies when all employees of a plant, whether participants or not, will be called upon to contribute one per cent of earnings. This includes officers as well as workmen.

When business is increasing new men must be added slowly, transfers must be made if possible from less busy departments, and overtime allowed only as a last resort. When work begins to fall off, overtime must be cut out where possible, the sales department stimulated

Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled from the Monthly Reports of Revenues and Expenses for 173 Steam Railways, Including 16 Switching and Terminal Companies.

FOR THE MONTH OF APRIL, 1930 AND 1929

Item	United States		Eastern District		Southern District		Western District	
	1930	1929	1930	1929	1930	1929	1930	1929
Average number of miles operated	242,461.69	242,258.80	60,567.67	60,431.35	45,754.65	45,766.38	136,139.37	136,061.07
Revenues:								
Freight	$345,813,395	$393,709,646	$152,704,887	$174,658,451	$64,253,220	$73,223,383	$128,855,288	$145,827,812
Passenger	a 59,585,513	b 67,521,459	33,533,682	36,317,547	8,168,817	9,728,027	17,883,014	21,475,885
Mail	9,246,354	c 9,877,914	3,517,582	4,091,488	1,560,766	1,587,520	4,168,006	4,198,906
Express	10,959,900	14,400,266	4,888,561	6,657,440	1,758,771	2,477,513	4,312,568	5,265,313
All other transportation	15,656,831	17,904,674	8,880,346	9,948,810	1,394,429	1,583,336	5,382,056	6,372,528
Incidental	9,165,814	10,570,297	5,015,100	5,671,095	1,306,346	1,410,456	2,844,368	3,488,746
Joint facility—Cr.	1,082,230	1,043,052	369,419	347,357	196,117	164,449	516,694	531,246
Joint facility—Dr.	306,879	326,863	82,419	81,509	33,388	34,941	191,072	210,413
Railway operating revenues	451,203,158	514,700,445	208,827,158	237,610,679	78,605,078	90,139,743	163,770,922	186,950,023
Expenses:								
Maintenance of way and structures	68,183,633	74,045,394	26,566,823	29,734,347	11,786,085	12,758,223	29,830,725	31,552,824
Maintenance of equipment	91,060,346	101,604,636	42,599,779	48,426,263	16,197,175	17,605,101	32,263,392	35,573,272
Traffic	11,009,704	10,409,083	4,212,288	3,841,812	1,989,095	1,925,321	4,808,321	4,641,950
Transportation	158,224,965	171,172,163	75,449,131	81,280,730	25,677,784	28,040,920	57,098,050	61,850,453
Miscellaneous operations	4,431,738	4,641,821	2,148,038	2,162,107	567,815	573,965	1,715,885	1,905,749
General	16,499,611	16,204,870	7,190,201	6,896,874	2,748,881	2,776,319	6,560,529	6,531,677
Transportation for investment—Cr.	1,195,646	1,032,576	292,537	215,520	73,164	77,025	829,945	740,031
Railway operating expenses	348,214,351	377,045,331	157,873,723	172,126,613	58,893,671	63,602,824	131,446,957	141,315,894
Net revenue from railway operations	102,988,807	137,655,114	50,953,435	65,484,066	19,711,407	26,536,919	32,323,965	45,634,129
Railway tax accruals	30,094,097	33,020,062	12,730,558	14,102,060	5,788,890	6,188,197	11,574,649	12,729,805
Uncollectible ry. revenues	87,816	120,868	29,803	57,849	18,916	25,556	39,097	37,463
Railway operating income	72,806,894	104,514,184	38,193,074	51,324,157	13,903,601	20,323,166	20,710,219	32,866,861
Equipment rents—Dr. balance	8,357,732	8,267,139	4,356,536	4,400,353	504,100	747,834	3,497,096	3,118,952
Joint facility rent—Dr. balance	2,177,581	2,078,668	1,137,660	1,083,940	169,342	188,859	870,579	805,869
Net railway operating income	62,271,581	94,168,377	32,698,878	45,839,864	13,230,159	19,386,473	16,342,544	28,942,040
Ratio of expenses to revenues (per cent)	77.17	73.26	75.60	72.44	74.92	70.56	80.26	75.59

FOR FOUR MONTHS ENDED WITH APRIL, 1930 AND 1929

Average number of miles operated	242,469.73	242,261.56	60,593.83	60,434.95	45,760.93	45,763.36	136,114.97	136,063.25
Revenues:								
Freight	$1,356,266,039	$1,518,946,243	$596,470,257	$670,093,397	$258,193,731	$283,315,672	$501,602,051	$565,537,174
Passenger	e 253,092,476	f 282,820,119	135,346,598	146,225,241	39,388,406	45,355,668	78,357,472	91,239,210
Mail	37,076,198	g 39,002,929	14,080,088	14,665,895	6,253,613	6,342,854	16,742,497	17,994,180
Express	38,320,706	45,876,276	17,333,543	21,662,102	6,180,847	7,732,864	14,806,316	16,481,310
All other transportation	58,806,916	67,385,456	33,799,086	37,932,330	4,724,015	5,099,997	20,283,815	24,353,129
Incidental	36,675,593	39,434,211	19,204,663	20,513,905	5,759,599	6,013,139	11,711,331	12,907,167
Joint facility—Cr.	4,312,041	4,136,492	1,386,230	1,386,801	761,638	615,250	2,164,173	2,134,441
Joint facility—Dr.	1,245,780	1,281,957	316,819	322,761	133,662	136,407	795,299	822,789
Railway operating revenues	1,783,304,189	1,996,319,769	817,303,646	912,156,910	321,128,187	354,339,037	644,872,356	729,823,822
Expenses:								
Maintenance of way and structures	237,968,166	254,329,935	98,281,108	104,449,032	45,941,309	49,872,737	93,745,749	100,008,166
Maintenance of equipment	370,218,801	398,647,946	173,096,455	190,497,312	65,929,988	68,966,154	131,192,358	139,184,480
Traffic	43,964,409	41,729,566	17,008,319	15,619,960	8,188,520	7,962,266	18,767,570	18,147,340
Transportation	654,232,576	701,248,380	310,527,424	330,718,981	105,788,380	113,477,830	237,916,772	257,051,569
Miscellaneous operations	18,374,399	18,715,810	8,721,261	8,739,920	2,644,847	2,611,057	7,008,291	7,364,833
General	65,918,576	64,171,409	29,106,134	27,763,296	10,894,502	10,858,832	25,917,940	25,549,281
Transportation for investment—Cr.	3,963,428	3,376,056	764,476	684,088	396,571	310,731	2,802,381	2,381,237
Railway operating expenses	1,386,713,499	1,475,466,990	635,976,225	677,104,413	238,990,975	253,438,145	511,746,299	544,924,432
Net revenue from railway operations	396,590,690	520,852,779	181,327,421	235,052,497	82,137,212	100,900,892	133,126,057	184,899,390
Railway tax accruals	118,479,946	128,610,078	47,904,271	52,648,673	23,560,286	24,565,220	47,015,389	51,396,185
Uncollectible ry. revenues	361,935	400,392	161,007	174,269	54,398	81,449	146,530	144,674
Railway operating income	277,748,809	391,842,309	133,262,143	182,229,555	58,522,528	76,254,223	85,964,138	133,358,531
Equipment rents—Dr. balance	31,074,209	30,266,280	16,142,598	16,361,403	1,012,332	1,105,820	13,919,279	12,799,057
Joint facility rent—Dr. balance	8,167,069	8,136,345	3,978,066	4,044,592	829,700	732,562	3,359,303	3,359,191
Net railway operating income	238,507,531	353,439,684	113,141,479	161,823,560	56,680,496	74,415,841	68,685,556	117,200,283
Ratio of expenses to revenues (per cent)	77.76	73.91	77.81	74.23	74.42	71.52	79.36	74.67

a Includes $2,916,332 sleeping and parlor car surcharge. b Includes $3,196,307 sleeping and parlor car surcharge. c Includes approximately $673,155 back mail pay. e Includes $12,363,435 sleeping and parlor car surcharge. f Includes $13,090,751 sleeping and parlor car surcharge. g Includes approximately $2,102,647 back mail pay.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

and employees put to work on standard apparatus for stock. Also the normal week must be cut down gradually, and possibly down to 50 per cent of normal.

Historical Bulletin No. 22

The Railway and Locomotive Historical Society, (Baker Library, Boston, Mass.) has issued its bulletin No. 22, a pamphlet of 62 pages, dated May, 1930, and priced at two dollars a copy. About half of this issue is taken up with a list of the locomotives of the Boston & Albany beginning with the year 1832, and other matter dealing with the history of this road and the Western Railroad, which was the predecessor company operating the line west of Worcester. The list of locomotives gives the name of each engine, the builder, the year when built, size of drivers, and the type. Many of the early names are given for two or more successive locomotives; for example, the "New York" was built by the Locks & Canal Company (Lowell) in 1842, and its successor was built in the Western Railroad shops in 1867. "Franklin" appears as the name of an engine built in 1840 of the 4-2-0 type; one by Hinkley, 4-4-0, built in 1848 and one built by the Boston & Albany in 1868. When the New York Central leased the road (A. D. 1900) it re-numbered the locomotives in a New York Central series, but a dozen years later concluded to let the Boston & Albany operate more fully under its own name and a new series was begun, including only locomotives used on that road. Photographs are given showing different types.

Other material in this bulletin includes a brief account of the railroad track laid across the St. Lawrence River on the ice in 1880, a brief history of the New York & New England Railroad (copied from a report made in 1879) and notes on the centenary of the Liverpool & Manchester.

Safety Section Meets at Denver

The Safety Section of the American Railway Association will hold its tenth annual meeting at the Cosmopolitan Hotel, Denver, Colo., on Tuesday, Wednesday and Thursday, July 1, 2 and 3. Following the opening address by Chairman L. G. Bentley (C. & O.), the speakers on Tuesday morning will be T. H. Carrow, (Penn.) and A. O. Ridgway, chief engineer of the Denver & Rio Grande Western.

On Tuesday afternoon the speakers will be E. R. Cott, (C. & O.); H. A. Rowe, (D., L. & W.), and H. R. Lake, (A., T. & S. F.); and there will be an address by W. P. Borland, director of the Bureau of Safety of the Interstate Commerce Commission.

On Wednesday morning the speakers will be F. Hartenstien (L. V.); C. T. Bailey (O. S. L.); W. M. Jeffers, (U. P.); J. E. Long, (D. & H.); and Isaiah Hale, (A., T. & S. F.). There will also be addresses by A. F. Whitney, president of the Brotherhood of Railroad Trainmen, and E. T. Howson, western editor of the *Railway Age*.

On Wednesday afternoon there will be a report of the committee on I. C. C. rule interpretations, Charles E. Hill (N. Y. C.), chairman; and a general discussion, open to all, on numerous safety subjects, which will be led by D. H. Beatty (Southern); M. J. Flanigan, (C., M., St. P. & P.); F. W. Curtis, (D. & R. G. W.); M. T. Fulton, (K. C. S.), and Robert Scott, (A. C. L.).

Thursday morning the principal speakers will be D. G. Phillips (Wabash); W. C. Stephenson, (A. C. L.), and B. S. Hollimon (T. & N. O.).

Elmer A. Sperry Dies Following Operation

Elmer A. Sperry, engineer and inventor, died on June 16 at St. John's Hospital, Brooklyn, N. Y., from complications which set in after he had recovered from an operation six weeks ago. He was in his seventieth year.

Mr. Sperry was born at Cortland, N. Y., October 12, 1860, and was educated at the State Normal School in that city. He subsequently attended Cornell University for one year but most of his training along the lines in which he specialized in his later life came from his own study and research. In 1879, when

Elmer A. Sperry

he was not yet 20 years of age, he perfected one of the first electric arc lights in America. In the following year he founded the Sperry Electric Company of Chicago for the manufacture of arc lamps, dynamos, motors and other electrical appliances. He also established the Sperry Electric Railway Company of Cleveland, Ohio, for the manufacture of cars, and in 1894, he sold this company to the General Electric Company of New York. His work from that time on included improvements in mining machinery, electrical equipment, street railway cars, inventions in the field of electro-chemistry and the practical application of the gyroscope to steamships. Previous to 1910 six large industrial corporations had been founded to manufacture Mr. Sperry's inventions. Since that time his fields of endeavor have been broadened still further, to include many devices used by navies throughout the world, as well as in aircraft and marine work in general. The Sperry gyroscope for stabilizing ships and airplanes, the gyro-compass, drift indicators, gun-fire control apparatus, bomb sighting devices and other appliances for which more than 400 patents have been granted, placed Mr. Sperry in the foremost rank of engineering progress. In January, 1929, he sold the Sperry Gyroscope Company, of which he had been president since 1910, to the North American Aviation Company, and soon after that started building up the Sperry Development Company, Inc., and the Sperry Rail Service Corporation. In 1930, he organized Sperry Products, Inc., as successor to the two last-named companies. In the early part of this year, Mr. Sperry was awarded the American Iron and Steel Institute medal, as mentioned in the *Railway Age* of February 8, page 396, for his work in connection with the development of the Sperry transverse fissure detector car, adopted by the American Railway Association and used by a number of railroads for the detection of transverse fissures in steel rails.

Mr. Sperry was a member and co-founder of the American Institute of Electrical Engineers and American Electrochemical Society, a member and president (1928) of the American Society of Mechanical Engineers, and a member of the American Chemical Society, the Society of Naval Architects and Marine Engineers, Society of Automotive Engineers, American Physical Society, American Academy of Arts and Sciences, National Aeronautic Association, National Academy of Science and a number of other scientific organizations. In addition to the Iron and Steel Institute medal mentioned above, he was also the recipient of the Franklin medal, 1914; grand prize for gyro-compasses and gyroscopes, San Francisco Exposition, 1915; Collier Trophy for drift set, 1916; Scientific American Medal, and the American Museum of Safety and John Fritz Medals. He went in 1929 as head of the United States delegation to the World Engineering Congress in Tokio, Japan.

* * *

The "New Yorker" Eastbound on the Grand Trunk Near Blue Island, Ill.

Traffic

The Traffic Club of Pittsburgh (Pa.) at its annual election last week chose as president for the ensuing year A. L. Doggett, general freight agent of the Baltimore & Ohio at Pittsburgh.

The board for the promotion of tourist traffic in Vienna and Lower Austria has opened an information office for tourists at Chicago, which will be in charge of Ottokar L. Mottel, at 1837 Juneway Terrace.

The operation of the Evansville, Indianapolis & Terre Haute was consolidated with the Cairo division of the Cleveland, Cincinnati, Chicago & St. Louis on June 15.

The Pennsylvania coal docks at Sandusky, Ohio, bettered a record of three years standing between midnight on June 9 and midnight on June 10, when 1,181 cars of coal from the Virginia coal fields were unloaded into lake boats. The previous record was set on May 6, 1927, when 1,051 cars were dumped in a 24-hour period.

T. A. T.-Maddux Air Line announces that fares by air-plane have been increased to seven cents a mile on the lines which make up the combined railroad and air route between the Atlantic seaboard and the Pacific coast. The lower rates lately in effect have increased the volume of traffic but not sufficiently to make a satisfactory income.

For the benefit of Philadelphians who sojourn at northern New Jersey seashore resorts in the summer, the Pennsylvania has introduced a new form of four-day round trip ticket which will be on sale both at Philadelphia and at the principal seashore resorts,—Long Beach, Asbury Park, Point Pleasant, Beach Haven, etc. Patrons will now have available, in either direction, both 17-day tickets and four-day tickets. From Long Branch the round trip rates to Philadelphia will be: two one-way fares $6.82; on a 17-day ticket, $5.10; four-day ticket, $4.

Southern Pacific Seeks to Compete with Panama Canal Lines

The Southern Pacific, the Southern Pacific Steamship Lines and the Texas & New Orleans have filed with the Interstate Commerce Commission a brief in support of their application for fourth section relief to enable them to establish reduced freight rates on a number of commodities between California terminal points and New York and Baltimore to enable them to compete with the intercoastal steamship lines through the Panama canal. They ask for rates 10 per cent above the going rates of the Intercoastal Conference and also for authority to maintain a 10 per cent differential in case of a change of the water rates without further application to the commission.

Representatives of employees of the Southern Pacific have also filed a brief in support of the application on the ground that to enable the Southern Pacific rail and water line to compete with the canal would furnish increased employment for railway men.

Fined For Not Collecting Demurrage

In the United States District Court at Philadelphia on June 9, the Pennsylvania Railroad, on a plea of guilty, was fined $10,000 for failing to collect proper demurrage charges on shipments of limestone from Bedford, Ind., to Philadelphia, in 1927. The amount of demurrage in question was $415, and the indictment charged that false entries were made to conceal the fact that in 13 instances demurrage was not collected.

Growth of Perishable Freight Traffic

"America's Dinner Table" was the title of a discussion of refrigerator cars by Curtis I. Sawdey, of Los Angeles, Cal., in a recent address. Mr. Sawdey is a shipper of lettuce from California "every day in the year" and he gave a sketch of the history of refrigerated transportation. Vegetables were shipped from Norfolk, Va., to New York by boat as early as 1850, but the first refrigerator car was brought out about 1868. Both strawberries and peaches were shipped experimentally in that year but the success was doubtful. The originator, Parker Earle, however, soon after, succeeded, using cars fitted with large bunkers. The first insulated refrigerator car did not appear until 1885. The first strawberries from California arrived in New York about 1886. Oranges came the same year and citrus fruit from Florida came in 1889. By 1905 there were 24,000 refrigerator cars in use and in 1921 there were 100,000. The estimated number in the United States today is 160,000.

Reading Enters Trans-Continental Motor Coach Tie-up

The Reading Transportation Company, motor coach subsidiary of the Reading Company, and the Jersey Central Transportation Company, motor coach subsidiary of the Central of New Jersey, have concluded negotiations with the Colonial-Atlantic-Pacific Stage System and connecting lines whereby the two railway subsidiaries will interchange traffic with the trans-continental system which serves 42 states and Canada. Schedules will be worked out to afford convenient connections and the railway subsidiaries will sell through tickets over the lines of the connecting carriers.

To provide for the increased business foreseen from the new arrangement, alterations are being made in the Reading Terminal at Philadelphia to provide for an enlarged modern motor coach station with waiting room and other facilities for passengers. Reading Transportation Company coaches will hereafter stop in Philadelphia not only at the Reading Terminal station, but also at the Colonial Stages station at 1229 Filbert street, and at the North Broad Street station of the Reading.

The new arrangement will provide through service not only to New Jersey seashore points, New York, Reading, Pottsville and other points served by the Jersey Central and Reading Transportation companies, but also to Washington, D. C., Pittsburgh and Chicago, with connections for Florida, New Orleans and Pacific coast points.

Rivers and Harbors Bill Before Senate

Debate on the rivers and harbors bill, which has been passed by the House, was begun in the Senate on June 16, after it had been made the unfinished business on the Senate calendar. As amended by the Senate commerce committee the bill authorizes projects for waterway improvements to the amount of $120,000,000, or about $10,000,000 more than the House bill. One of the principal points of controversy in the bill involved the provision authorizing the Secretary of War to accept from the state of New York for the federal government the Erie and Oswego canals and to maintain them at an estimated annual cost of $2,500,000. This was vigorously opposed by the advocates of the St. Lawrence waterway scheme because of the efforts being made by New York interests to have the New York canals deepened as a part of an "All-American seaway" to take the place of the proposed St. Lawrence route; but a compromise was adopted by the commerce committee which was accepted by the Senate on June 16. The compromise amendment adds a proviso that no project for the widening or deepening of the canals, or for the elevation of bridges in connection therewith, shall proceed without subsequent authorization of Congress. This was taken by the advocates of the St. Lawrence route as committing the present Congress to keeping the canals for barge purposes and leaving open the opportunity to adopt the St. Lawrence route for a "seaway" for ocean ships.

Hearings Begun in Lake Cargo Rate Case

Hearings in the latest phase of the lake cargo coal rate controversy, resulting from complaints filed with the Interstate Commerce Commission by Ohio and Pennsylvania coal operators, were begun at Washington on June 16 before Examiner C. M. Bardwell. The complaints seek to have the commission correct what they declare to be the unjust discrimination existing in the relation between the rates on lake cargo coal from the north-

ern district fields of Ohio and Pennsylvania and those from the southern district fields of Virginia, West Virginia, Kentucky and Tennessee, which are now 35 cents higher per ton than those from the northern fields. The commission in its last lake cargo decision, in 1927, sought to establish a differential of 45 cents a ton by reducing the rates from the northern fields, but after still further competitive reductions made by the roads involved a compromise was reached on the basis of $1.46 a ton from the Pittsburgh district and $1.81 from a large part of the southern district. The first witness was A. B. McElvany, traffic manager for western Pennsylvania operators. When he was asked by counsel for the southern operators what the northern districts are demanding in the way of a spread between the rates from the rival districts, counsel for the northern operators objected, saying that in an undue prejudice case the duty of saying how the undue prejudice shall be removed rests with the commission.

Freight Traffic in April

The freight traffic handled by Class I railroads in April amounted to 34,894,055,000 net ton-miles, according to reports compiled by the Bureau of Railway Economics. Compared with April, 1929, this was a reduction of 3,451,584,000 net ton-miles, or 9 per cent, and it was a reduction of 993,119,000 net ton-miles, or 2.8 per cent, under April, 1928. In the Eastern district, the freight traffic handled in April was a reduction of 8.6 per cent compared with the same month in 1929, while the Southern district reported a reduction of 10.9 per cent. In the Western district there was a reduction of 8.9 per cent.

Freight traffic handled by Class I railroads in the first four months of 1930 amounted to 141,250,836,000 net ton-miles, a reduction of 14,672,168,000 net ton-miles or 9.4 per cent under that of the corresponding period in 1929 and a reduction of 6,134,459,000 net ton-miles, or 4.2 per cent, under that of the same period in 1928. Railroads in the Eastern district for the four months' period reported a decrease of 8.9 per cent in the volume of freight traffic compared with the same period in 1929, while the Southern district reported a decrease of 9.9 per cent. The Western district reported a decrease of 9.9 per cent.

The average speed of freight trains was 13.8 miles, which is the same as that attained in March this year, but an increase of one-half a mile above that for April last year and an increase of 3.7 miles above the same month in 1920.

The average daily movement per freight car in April this year was 29.6 miles, compared with 32 miles for the same month last year, and 29.9 miles in April, 1928.

The average load per car in April this year was 25.7 tons, including less than carload freight as well as carload freight. This was an increase of one-tenth of one ton above the average for April, 1929, and also for that of April, 1928.

Equipment and Supplies

Freight Cars

THE ALUMINUM COMPANY OF AMERICA is inquiring for 25 hopper cars of 70 tons' capacity.

THE ANGLO-CHILEAN CONSOLIDATED NITRATE CORPORATION is inquiring for 350 steel ore cars of 30 tons' capacity.

Passenger Cars

THE ERIE is inquiring for two mail and express cars.

THE CENTRAL OF GEORGIA is inquiring for two baggage and express cars and for one baggage and mail car.

THE ERIE has ordered three dining cars from the Pullman Car & Manufacturing Corporation.

THE BOSTON & MAINE has ordered four dining cars from the Pullman Car & Manufacturing Corporation. Inquiry for this equipment was reported in the *Railway Age* of May 10.

THE ERIE has ordered three all-steel combination mail and express cars, 70 ft. long, from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of May 17.

Iron and Steel

THE BALTIMORE & OHIO has ordered 225 tons of steel for two bridges in Maryland from the Mt. Vernon Bridge Company.

THE NORFOLK & WESTERN has ordered 800 tons of steel for a shop building at Roanoke, Va., from the Ingalls Iron Works.

THE MICHIGAN CENTRAL has ordered 200 tons of steel for its Lonsdale Avenue bridge at Detroit, Mich., from the American Bridge Company, and 160 tons for its Springwell Avenue bridge at Detroit from the McClintic-Marshall Company.

THE NORFOLK & WESTERN has placed orders for 40,000 tons of 130-lb. rail, 30,000 tons being ordered from the United States Steel Corporation and 10,000 tons from the Bethlehem Steel Company. Inquiry for this rail was reported in the *Railway Age* of May 31.

Signaling

THE SOUTHERN PACIFIC COMPANY has ordered from the General Railway Signal Company an electric interlocking for Dayton Avenue, Los Angeles, Cal.; 40 working levers and 16 spare spaces.

THE PENNSYLVANIA has ordered from the Union Switch & Signal Company material for three electro-pneumatic interlockings to be installed at Valley Stream, L. I. (Long Island Railroad). The order includes 21 electro-pneumatic switch movements, 44 position-light signals and other apparatus.

THE INDIANAPOLIS UNION has contracted with the Union Switch & Signal Company for the erection of an electro-pneumatic interlocking at Union Station, Indianapolis, Ind. This contract deals with the eastern half of the terminal, and it includes an interlocking machine, Model 14, of 111 levers; 64 light signals, 57 switch movements, etc.

THE TEXAS & NEW ORLEANS has ordered from the Union Switch & Signal Company materials for the installation of automatic block signals and centralized traffic control on its line between Alpine, Tex., and Paisano, 12 miles, single track. The control machine will be at Alpine. The order includes 13 semaphore signals, style T-2, six low-voltage switch movements and other material.

Extension of Centralized Control on M. P.

The Missouri Pacific has ordered from the General Railway Signal Company materials for the extension of the limits of centralized control signaling now centered at Pacific, Mo. The additional territory will consist of 18 miles, double track, and 3½ miles of single track, from Kirkwood, Mo., to Washington. With the addition, the machine at Pacific will have a total of 21 working levers.

* * *

A Milk Train on the Boston & Maine at Clematis Brook, Mass.

Supply Trade

The National Bearing Metals Corporation, St. Louis, Mo., has recently acquired a new plant at St. Paul, Minn.

Benjamin B. Shaw has been appointed sales representative in the railroad department of the **Wood Conversion Company,** with headquarters at Chicago.

The Valspar Corporation, New York, has merged the **Detroit Graphite Company,** Detroit, Mich., and the **Dominion Paint Works, Ltd.,** Walkerville, Ontario, with its existing units. The plans for consolidating the activities of the two companies with the other units of The Valspar Corporation do not contemplate any change in management or loss of identity in these two new subsidiaries.

Ray H. Moore, who has been appointed district sales manager in charge of the Cleveland (Ohio) office of the **Whiting Corporation,** Harvey, Ill., has been connected with that company since 1926. Prior to his employment at that

Ray H. Moore

time Mr. Moore served with a number of foundry equipment manufacturers, specializing in the development of cleaning room equipment. As manager of foundry equipment with the Whiting Corporation, he has been engaged in the design and development of foundry equipment, including tumbling mills and dust filters.

William Hildebrand, traffic manager of the **Thomas A. Edison Industries, Inc.,** West Orange, N. J., has been elected a vice-president of that corporation. Mr. Hildebrand, who was born in Newark, N. J., began his business career with the Pennsylvania, but after a few years in railroad work he became associated with the Edison Industries and has been with that company for the greater part of his active life. He has served as president of the New Jersey Industrial Traffic League and is also a member of the transportation committee of the Newark Chamber of Commerce and a vice-president and director of the Newark Traffic Club.

Herbert Hoover, formerly general distribution engineer for the Potamac Electric Power Company, has joined the Philadelphia (Pa.) branch sales force of the **Wagner Electric Corporation,** St. Louis, Mo. After graduating from a course in electrical engineering at the University of Oklahoma in 1917, Mr. Hoover served during the war with the United States Army. In 1919, he entered the employ of the Empire District Electric Company, Joplin, Mo., supervising the operation of overhead transmission distribution systems in the lead and zinc fields of Oklahoma, Kansas, and Missouri. From 1920 to 1923 he was again connected with the army as a member of the Dawes commission and the Engineering Topography division, after which he became connected with the Potomac Electric Power Company.

Correction

As a result of an unfortunate error in the identification of cuts as received for the article published on page 1449 of the *Railway Age* of June 14, concerning the appointments of Charles Edward Brown, Jr., and Elbridge H. McNeill as assistant to the general manager and manager of the power and light department of the Chicago branch, respectively, of the Okonite Company, Passaic, N. J., the photograph of each man appeared over the name of the other. That is, Mr. McNeill's picture was published with the name Charles Edward Brown, Jr., while Mr. Brown's photograph bore Mr. McNeill's name.

Obituary

J. L. Rowe, manager of railroad sales of the Chicago Pneumatic Tool Company, New York, died on June 5 from injuries sustained in an automobile accident. Mr. Rowe had been with the company since 1919.

* * *

A Chicago & Eastern Illinois Train on the Chicago & Western Indiana

Construction

BALTIMORE & OHIO.—This company has prepared and announced plans, to be carried out in the near future, for extensive station and terminal improvements at Toledo, Ohio, and at Johnstown, Pa. The Toledo project involves the construction of a new freight terminal on the site of the existing facilities along Ottawa street. The new outbound freight house will be 30 ft. by 500 ft. with a two-story portion to provide for the necessary office space, while adjacent to it there will be an inbound house 50 ft. by 620 ft. Both buildings, which will be of brick and steel construction, with rolling steel doors and concrete tile roofs, will be served by driveways extending from Washington and Ottawa streets. The present team track along Ottawa street, on an upper level, will be retained, while a gantry crane covering two tracks and serving eight cars is to be provided for the handling of heavy shipments. The track layout will provide for placing 84 cars on team tracks and 39 cars at each freight house, with additional storage space for 165 cars.

Both passenger and freight facilities will be affected by the contemplated improvements at Johnstown. Owing to the widening of Washington street, these facilities will be moved to Baumer street, where a modern brick passenger station, served by concrete platforms and driveways, will be built. The new freight house, also on Baumer street, will be of brick and steel construction, 30 ft. by 305 ft., with an 8-ft. platform running the full length of the building and an additional platform 20 ft. by 370 ft. provided with a 25-ton crane. A second story will be added to allow necessary office space, while the entire building will be served by convenient driveways and team tracks. Storage and car repair tracks, now located on Baumer street, will be moved to Messenger street, where work on the new layout is already under way.

CANADIAN PACIFIC.—This company receives bids until June 20 for the construction of freight sheds and offices at Humboldt, Sask., North Battleford and Prince Albert.

CHICAGO, ROCK ISLAND & PACIFIC—WABASH.—The St. Louis (Mo.) Board of Public Service closes bids at noon on July 15 for the construction of three bridges over the depressed tracks of these railways in Forest Park, St. Louis. This proposed construction will include a steel truss and concrete pedestrian bridge, a reinforced concrete continuous slab bridge to carry Grand drive and a reinforced concrete continuous slab bridge to carry Lindell and Union boulevards. The city engineer's estimate of the cost of these structures is $145,500.

CHICAGO, ROCK ISLAND & PACIFIC—ST. LOUIS-SAN FRANCISCO.—Bids will be received until June 23 for the construction

of a union station at Oklahoma City, Okla., plans for which are in charge of the architect for the Frisco. The building, which will have outside dimensions of about 222 ft. by 360 ft. and will be one and one-half stories high, with a tower and basement, will be constructed of concrete, brick, steel and stone. Included in the project, which involves a total expenditure of approximately $2,500,000, will be two platforms, each 1,300 ft. long, and a boiler house.

CITY OF BALTIMORE.—The Department of Public Works of the City of Baltimore (Md.) has awarded to Catalano & Pecora, Baltimore, a contract for the construction of an underpass on Eastern avenue, eliminating grade crossings with the Pennsylvania at Iris and Kresson streets, East Baltimore, and with the Baltimore & Ohio freight line between Kresson and Lehigh streets. The underpass is to be 1,933 ft. in length and 77 ft. wide, and will cost $436,367.

ERIE.—Contracts for the construction of a new two-story pier, 1,050 ft. long by 70 ft. wide, to be located immediately south of pier No. 9, which spans the New Jersey entrance to the Holland vehicular tunnel at the Erie's Jersey City (N. J.) terminal, have been awarded by this company to the Frederick Snare Corporation, New York. The new terminal, which will be of steel and concrete construction throughout, is designed for the handling of westbound lighterage shipments. It will be served through its entire length by two railroad tracks and is to be equipped with five heavy-duty elevators, while its exterior finish will be in accord with its companion pier No. 9. Work on the new pier, which in part is to occupy Jersey City water frontage formerly covered by an old wooden pier burned several years ago, will be started as soon as possible and rushed to completion. It was reported in the *Railway Age* of May 24 that bids for this project were being received.

ILLINOIS TERMINAL.—The following contracts have been awarded in connection with the construction of a reinforced concrete and steel elevated double-track line to connect the present surface line on Twelfth street, St. Louis, Mo., with the McKinley bridge, and including a river pier and a new southwestern approach to the bridge: Steel fabrication, to McClintic-Marshall Company, Pittsburgh, Pa.; steel erection, to Ben Hur Erection Company, St. Louis; substructure for river pier, to G. Locke Tarlton Company, St. Louis; river pier, and temporary freight station and office building on Twelfth street between Wash and Carr streets, to the Fruin-Colnon Contracting Company, St. Louis. The cost of the work awarded is about $1,500,000.

NEW YORK CENTRAL.—The time allowed for the completion of the electrification of this company's west side freight line between Seventy-Second street, New York City, and St. John's Park, or such other southerly freight terminal as may be provided for or operated by the company, has been extended from July 1, 1930, to January 1, 1931, by order of the Public Service Commission of New York. The time limit for the completion of the work was originally fixed as July 1, 1930, by a commission order of July 21, 1926, but it has been found impracticable to discontinue the use of steam locomotives in the given area within such a time.

PENNSYLVANIA.—A contract amounting to $1,583,000 has been awarded by this company to J. Rich Steers, Inc., New York, for the construction of Pier F at the foot of Bay street, Jersey City, N. J. The new pier, which will be of steel and concrete construction and will extend from 900 to 1,000 ft. into the Hudson river, is the third of three new piers being built by the Pennsylvania as a part of its $50,000,000 rail-water terminal at Jersey City.

PENNSYLVANIA.—This company plans the immediate construction of improvements to the Union station at Columbus, Ohio, which will involve the expenditure of about $750,000. The present train shed will be razed and umbrella sheds will be constructed in its place, the present platforms and tracks will be lengthened and additional protection from smoke and gases will be provided for the superstructure over the tracks.

SOUTHERN.—A contract for the construction of a water treating plant at Shelbyville, Ky., has been awarded to the R. D. Cole Manufacturing Company, Newman, Ga.

ULSTER & DELAWARE.—Plans are being prepared by the Department of Public Works of the State of New York for the elimination of grade crossings of this company's tracks at East Main and Beaver streets, Stamford, N. Y. The work, which will be done by the railroad company, involves the construction of an overhead bridge about 180 ft. northeast of the present crossings.

VIRGINIAN.—A contract for sections A and B of a bridge over the Kanawha river at Deepwater, W. Va., has been awarded by this company to Boxley Brothers Company, Inc., Orange, Va. The construction of the bridge will provide a one-mile connection between the Deepwater terminus of the Virginian and the Kanawha & Michigan, as previously authorized by the Interstate Commerce Commission.

TO ACCOMMODATE SHRINERS returning east from their annual meeting in Toronto, last week, the Pennsylvania assembled at Buffalo 14 dining cars, 10 of which were sent in a single train, dead-head, from the New York terminal on Thursday morning. Calculating the cost of a dining car at $42,000 and its equipment at $7,000, the Pennsylvania people estimate that this dead-head train represented an investment of $600,000; and the 168 employees on the 14 cars planned to serve while on these runs a total of 2,800 meals.

Financial

ATLANTIC COAST LINE.—*Abandonment.*—The Interstate Commerce Commission has denied this company's petition for a rehearing of the case in which the commission denied to authorize the abandonment of a line from Yuste to Monticello, Fla., 4.8 miles, which had been abandoned before the authority was sought.

CHESAPEAKE & OHIO.—*Change in Par Value of Stock.*—This company has applied to the Interstate Commerce Commission for authority to issue $191,528,317 of common stock of a par value of $25 a share, in exchange for an equal amount of stock of $100 par value now outstanding, held in the treasury or authorized to be issued. Of the total $211,200 is to be issued from time to time in conversion of 6½ per cent cumulative convertible preferred stock. The application says that experience indicates that investors prefer to invest in shares of a relatively lower market price than was customary 10 to 15 years ago and that it is believed the reduction in par value will result in a large increase in the number of stockholders. It is stated that after eliminating the largest single shareholder, the average holding of the company's stock was 104.8 shares, having a market value on June 2 of $22,322.

CHICAGO & NORTH WESTERN.—*Equipment Trust.*—The First National Bank (New York) and Salomon Bros. & Hutzler are offering $1,425,000 of the 4½ per cent series X equipment trust certificates of this company, maturing in installments from 1931 to 1945, at prices to yield from 3¾ per cent to 4½ per cent.

CHICAGO, ROCK ISLAND & PACIFIC.—*Equipment Trust.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $14,040,000 of its series Q, 4½ per cent equipment trust of 1930 certificates, maturing in installments from 1930 to 1945. The issue is authorized for sale to the highest bidder, the First National Bank and Salomon Bros. & Hutzler, at 98.85, which will make the average annual cost to the railroad approximately 4.6874 per cent.

CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS.—*Bonds.*—J. P. Morgan & Co., the First National Bank, the National City Company and the Guaranty Company of New York are offering priced at 98 to yield 4.60 per cent $24,000,000 of series E 4½ per cent refunding and improvement mortgage bonds of this company. The issue will mature in 1977 and is redeemable at premiums ranging downward from 5 per cent.

DENVER & RIO GRANDE WESTERN.—*Bonds.*—The Interstate Commerce Commission has authorized this company to procure authentication and delivery of $718,000 of refunding and improvement

(Continued on page 1500)

Annual Reports

The New York Central Railroad Company

To the Stockholders of

THE NEW YORK CENTRAL RAILROAD COMPANY:

The Board of Directors herewith submits its report for the year ended December 31, 1929, with statements showing the income account and the financial condition of the company.

The Year's Business

Operating revenues for 1929 were $396,917,258.74, an increase over 1928 of $15,184,014.42, notwithstanding some recession in business in the later months of the year.

Revenue freight carried amounted to 118,016,598 tons, an increase of 6,535,825 tons, the revenue therefrom being $242,332,736.76, an increase of $7,715,094.70. Coal, coke, iron ore, and manufactured commodities moved in greater volume. There was a falling off in the tonnage of grain, due to poorer crops, and in certain other agricultural products, while curtailment of building activities and road construction in some sections resulted in a smaller tonnage of stone, sand, cement, and brick.

The company carried 72,330,177 revenue passengers, an increase of 991,335. Interline passengers were 109,528 and local passengers 364,927 less than in 1928, but commutation passengers increased 1,465,790, due to the expansion of suburban territory adjacent to New York and other large cities on the company's line. The revenue received from passenger business amounted to $97,105,738.07, an increase of $188,694.93.

While the net railway operating income for 1929 was $64,624,663.56 or $2,402,541.60 more than for 1928, the net income was $78,277,291.89, or an increase of $27,942,806.79. This increase is largely attributable to the inclusion in non-operating income for 1929 of extra dividends received on the company's holdings of stock of The Michigan Central Railroad Company, Chicago River and Indiana Railroad Company, and Indiana Harbor Belt Railroad Company.

Income Account for the Year

INCLUDING BOSTON AND ALBANY RAILROAD AND OHIO CENTRAL LINES

	Year ended Dec. 31, 1929	Year ended Dec. 31, 1928	+ Increase or — Decrease
OPERATING INCOME	6,915.26 *miles operated*	6,911.27 *miles operated*	+3.99 *miles*
RAILWAY OPERATIONS			
Railway operating revenues	$396,917,258.74	$381,733,244.32	+$15,184,014.42
Railway operating expenses	302,614,246.33	288,250,203.20	+ 14,364,043.13
NET REVENUE FROM RAILWAY OPERATIONS	$94,303,012.41	$93,483,041.12	+ $819,971.29
Percentage of expenses to revenues	(76.24)	(75.51)	+ (.73)
Railway tax accruals	$27,626,062.33	$29,136,903.40	— $1,510,841.07
Uncollectible railway revenues	99,348.73	130,543.88	— 31,195.15
RAILWAY OPERATING INCOME	$66,577,601.35	$64,215,593.84	+ $2,362,007.51
Equipment rents, net debit	$5,096,157.82	$5,082,960.30	+ $13,197.52
Joint facility rents, net credit	3,143,220.03	3,089,488.42	+ 53,731.61
NET RAILWAY OPERATING INCOME	$64,624,663.56	$62,222,121.96	+ $2,402,541.60
MISCELLANEOUS OPERATIONS			
Revenues	$699,317.71	$806,434.21	— $107,116.50
Expenses and taxes	706,506.67	771,857.88	— 65,351.21
MISCELLANEOUS OPERATING DEFICIT	$7,188.96	$34,576.33*	+ $41,765.29
TOTAL OPERATING INCOME	$64,617,474.60	$62,256,698.29	+ $2,360,776.31
NON-OPERATING INCOME			
Income from lease of road	$139,936.05	$121,460.21	+ $18,475.84
Miscellaneous rent income	5,028,251.99	4,678,141.05	+ 350,110.94
Miscellaneous non-operating physical property	2,670,058.23	1,670,448.10	+ 999,610.13
Separately operated properties—profit	713,073.38	625,521.14	+ 87,552.24
Dividend income	41,174,838.09	19,604,392.20	+ 21,570,445.89
Income from funded securities and accounts	4,980,927.55	3,251,582.82	+ 1,729,344.73
Income from unfunded securities and accounts	3,949,638.29	4,330,899.54	— 381,261.25
Income from sinking and other reserve funds	203,232.39	187,673.12	+ 15,559.27
Miscellaneous income	$286,996.92	$124,622.45	+ $162,374.47
TOTAL NON-OPERATING INCOME	$59,146,952.89	$34,594,740.63	+$24,552,212.26
GROSS INCOME	$123,764,427.49	$96,851,438.92	+$26,912,988.57
DEDUCTIONS FROM GROSS INCOME			
Rent for leased roads	$14,553,046.58	$14,117,576.90	+ $435,469.68
Miscellaneous rents	1,125,551.51	1,381,959.89	— 256,408.38
Miscellaneous tax accruals	1,851,106.64	1,738,966.97	+ 112,139.67
Separately operated properties—loss	50,434.63	52,899.70	— 2,465.07
Interest on funded debt	26,497,379.92	27,744,694.35	— 1,247,314.43
Interest on unfunded debt	659,678.51	752,012.48	— 92,333.97
Amortization of discount on funded debt	491,922.03	456,381.85	+ 35,540.18
Maintenance of investment organization	7,658.32	3,777.75	+ 3,880.57
Miscellaneous income charges	250,357.46	268,683.93	— 18,326.47
TOTAL DEDUCTIONS FROM GROSS INCOME	$45,487,135.60	$46,516,953.82	— $1,029,818.22
NET INCOME	$78,277,291.89	$50,334,485.10	+$27,942,806.79
Per cent to capital stock outstanding	(16.88)	(10.85)	+ (6.03)
DISPOSITION OF NET INCOME			
Dividends declared (8 per cent in each year)	$37,090,531.60	$34,854,879.30	+ $2,235,652.30
Sinking and other reserve funds	190,948.89	175,851.37	+ 15,097.52
TOTAL APPROPRIATIONS OF INCOME	$37,281,480.49	$35,030,730.67	+ $2,250,749.82
SURPLUS FOR THE YEAR CARRIED TO PROFIT AND LOSS	$40,995,811.40	$15,303,754.43	+$25,692,056.97

* Credit.

Profit and Loss Account

BALANCE TO CREDIT OF PROFIT AND LOSS, DECEMBER 31, 1928		$258,798,616.58
ADDITIONS:		
Surplus for the year 1929	$40,995,811.40	
Profit on securities sold (net)	34,366.72	
Sundry adjustments (net), unrefundable overcharges and uncollectible accounts	130,659.73	41,160,837.85
		$299,959,454.43
DEDUCTIONS:		
Surplus appropriated for investment in physical property	$134,992.09	
Depreciation prior to July 1, 1907, on equipment retired during the year	613,706.84	
Loss on property retired	4,108,462.98	
Loss on property sold (net)	91,914.12	4,949,076.03
BALANCE TO CREDIT OF PROFIT AND LOSS, DECEMBER 31, 1929		$295,010,378.40

Road Operated

The following is a comparative table of mileage operated:

	1929 Miles	1928 Miles	Increase Miles	Decrease Miles
Main line and branches owned	3,725.43	3,725.95		.52
Leased lines	2,640.04	2,632.25	7.79	
Lines operated under trackage rights	549.79	553.07		3.28
Total road operated	6,915.26	6,911.27	3.99	

The decrease of 52/100ths of a mile in main line and branches is the net result of shortening the Buffalo Belt Branch and other tracks in connection with Buffalo improvements, lengthening the eastbound main track of the Cleveland Short Line and a slight increase in the mileage of the Kankakee Branch due to grade elimination.

The increase of 7.79 miles in leased lines results from the reclassification of the Dillonvale and Smithfield Railway, 4.42 miles, formerly listed as trackage rights, that part of the Zanesville Terminal Railroad, Spangler to West Zanesville, 2.79 miles, and the Mt. Gilead Short Line, 74/100ths of a mile,

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taken over for operation during the year, together with the reclassification of sundry wyes and connecting tracks.

The decrease of 3.28 miles in trackage rights is due principally to reclassification of the Dillonvale and Smithfield Railway, heretofore mentioned, offset by increases in mileage of sundry tracks over which the company has rights.

Operating Expenses

Operating expenses were as follows:

Group	Amount	Increase	Decrease
Maintenance of way and structures	$53,253,741.81	$2,279,232.21	
Maintenance of equipment	88,739,954.53	6,792,160.80	
Traffic expenses	5,841,783.70	415,249.52	
Transportation expenses	137,265,129.39	4,033,750.30	
Miscellaneous operations	6,715,466.32	408,725.25	
General expenses	11,213,645.48	504,788.91	
Transportation for investment—credit	415,474.90		$69,863.86
Total	$302,614,246.33	$14,364,043.13	

The increase in expense for maintenance of way and structures is due principally to extensive renewals and rearrangements of interlocking and signal apparatus, the removal of the electric power facilities at 50th Street, New York, incident to the erection of the Waldorf-Astoria Hotel, to the renewal of engine facilities and to severe weather conditions in the latter part of the year.

The increase in expense for maintenance of equipment is the result of a larger number of locomotives and freight cars retired during the year, a more extensive program of repairs and increased charges for depreciation of equipment due to the larger number of units in service.

The increase in traffic expenses is due principally to increase in the cost of off-line representation and advertising.

The increase of $4,033,750.30 in transportation expenses was largely incident to the increase in traffic.

The increase of expenses for miscellaneous operations is principally due to the extension of the dining car service.

There were increases in nearly all items of general expenses, the major increases being in pension payments and for increased forces made necessary by valuation requirements of the Interstate Commerce Commission.

Railway Tax Accruals

Railway tax accruals, details of which will be found on page 41, were $27,626,062.33, a decrease of $1,510,841.07. Federal income taxes decreased $1,513,258.05 due to a reduction in the rate of taxation from 12 to 11 per cent and to taxes paid in 1928 upon the profits realized from the sale of securities.

Equipment Rents

The net debit to equipment rents amounted to $5,096,157.82, an increase of $13,197.52. Increases of $232,528.81 for rental of freight cars and $31,349.57 for rental of passenger equipment, due to increased traffic, are partly offset by a decrease in rentals for floating equipment of $99,261.50 and by increased credits for rentals of locomotives and work equipment amounting to $107,441.47 and $43,977.89 respectively.

Joint Facility Rents

There was a net credit to joint facility rents of $3,143,220.03, an increase of $53,731.61, the net result of an increase of $55,861.40 from the rental of facilities maintained by the company and an increase of $2,129.79 in the rental paid for the use of facilities maintained by others.

Miscellaneous Operations

This account includes only the operation of the company's live stock yards at Buffalo. Due to decrease in volume of live stock handled, the yards were operated at a loss of $7,188.96, as compared with a profit of $34,576.33 in 1928.

Non-Operating Income

Non-operating income amounted to $59,146,952.89, an increase of $24,552,212.26, made up as follows:

Income from lease of road increased $18,475.84, of which $13,105.67 was in rental received from the Pittsburgh and Lake Erie Railroad Company for the use of four side tracks at Valley Yard, Ohio.

Miscellaneous rents increased $350,110.94, attributable to increased rentals for property in the Grand Central Terminal area and to rentals of property acquired during the year.

Income from miscellaneous physical property, principally in the Grand Central Terminal area, including the New York Central Building, increased $999,610.13.

An increase of $87,552.24 in profit from separately operated properties resulted from increased revenues from the operation of the Pittsburgh McKeesport and Youghiogheny Railroad.

Dividend income increased $21,570,445.89, mainly due to extra dividends received upon the stock of The Michigan Central Railroad Company, The Chicago River and Indiana Railroad Company, and the Indiana Harbor Belt Railroad Company.

Income from funded securities and accounts increased $1,729,344.73, representing interest on additional advances to The Cleveland Cincinnati Chicago and St. Louis Railway Company and the Cleveland Union Terminals Company, and interest received upon Improvement Bonds of the Boston and Albany Railroad Company, acquired in 1929 and held in the treasury.

Income from unfunded securities and accounts decreased $381,261.25.

Miscellaneous income increased $162,374.47.

Deductions from Gross Income

Deductions from gross income aggregated $45,487,135.60, a decrease of $1,029,818.22, explained as follows:

Rent for leased roads increased $435,469.68, due to larger payments to the Mahoning Coal Railroad Company by reason of increased earnings of that road, and to additional rental accrued to provide for interest on the new Improvement Bonds of the Boston and Albany Railroad Company.

Miscellaneous rents decreased $256,408.38, due mainly to adjustment of rentals and taxes on various properties leased from the City of New York.

Miscellaneous tax accruals increased $112,139.67, due principally to assessments on newly acquired property in the Grand Central Terminal area.

Interest on funded debt decreased $1,247,314.43, due to the retirement, in September, 1928, of $50,000,000 of Lake Shore and Michigan Southern Railway Company gold bonds of 1903, offset in part by interest paid upon advances.

Interest on unfunded debt decreased $92,333.97, attributable to less interest paid to New York State Realty and Terminal Company and others in connection with operations in the Grand Central Terminal area, offset in part by increased payments of interest on loans.

Net Income Before Dividends and Other Appropriations

The net income of the company was $78,277,291.89, an increase of $27,942,806.79, and amounted to 16.88 per cent upon the capital stock outstanding at the end of the year.

Dividends

No. 58, 2 per cent on 4,635,563.95 shares, declared March 13, 1929, payable May 1, 1929	$9,271,127.90
No. 59, 2 per cent on 4,635,566.95 shares, declared June 12, 1929, payable August 1, 1929	9,271,133.90
No. 60, 2 per cent on 4,637,066.95 shares, declared September 11, 1929, payable November 1, 1929	9,274,133.90
No. 61, 2 per cent on 4,637,067.95 shares, declared December 11, 1929, payable February 1, 1930	9,274,135.90
Total for year, 8 per cent	$37,090,531.60

Dividends were not paid on unconverted scrip, equaling 28.3975 shares for Dividend No. 58, 25.3975 for Dividends Nos. 59 and 60, and 24.3975 for Dividend No. 61, nor on 5/100ths of a share held by the company.

Surplus

After charges for dividends aggregating $37,090,531.60 and other appropriations amounting to $190,948.89, there remained a surplus for the year of $40,995,811.40 which was carried to the credit of profit and loss. At the end of the year the total corporate surplus amounted to $298,253,205.21.

Income Account Comparisons for Recent Years

Year	Gross revenue	First charges	Net income	Dividends	Surplus carried to profit and loss
1921	$322,819,568.75	$54,927,739.96	$22,295,685.78	$12,479,641.01	$9,747,587.57
1922	363,616,475.75	52,103,676.93	20,635,186.06	12,876,984.76	7,643,871.34
1923	421,034,783.91	50,528,266.88	45,339,426.69	17,432,978.43	27,748,777.54
1924	369,606,930.30	49,670,903.64	39,250,399.92	20,728,835.39	18,399,461.00
1925	385,994,504.80	44,802,796.48	48,627,223.57	26,732,833.39	21,768,272.54
1926	399,537,748.86	45,593,416.85	55,664,040.98	26,827,814.64	28,691,046.93
1927	383,377,311.19	45,912,405.81	58,565,145.30	30,462,783.11	27,942,658.08
1928	381,733,244.32	46,516,953.82	50,334,485.10	34,854,879,30	15,303,754.43
1929	396,917,258.74	45,487,135.60	78,277,291.89	37,090,531.60	40,995,811.40

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Property Investment Accounts

Increases in the property investment accounts for the year, shown in detail elsewhere in this report, were:

Road	$24,968,689.56
Equipment	21,027,198.62
Miscellaneous physical property	3,633,418.05
Improvements on leased railway property	5,858,845.14
a total of	$55,488,151.37

Acquisition of Shares of Capital Stock of The Cleveland, Cincinnati, Chicago & St. Louis Railway Company

The company acquired during the year 30,929 shares of the common stock of The Cleveland Cincinnati Chicago and St. Louis Railway Company, making its holdings on December 31, 1929, 460,341.17 shares of common stock and 84,681 shares of preferred stock, a total of 95.57 per cent of the total number of shares outstanding. In the latter part of the year the company purchased 19,419 shares of common stock at $240 per share under an agreement with a committee of the common stockholders and thereafter acquired a substantial number of shares at the same price under an offer, which expired December 15, 1929, made to all of the minority stockholders.

Increase of Authorized Capital Stock

The Board of Directors, on November 13, 1929, adopted resolutions for an increase in the authorized capital stock of the company from $500,000,000 to $700,000,000, and directed that the proposed increase be submitted to the stockholders at the annual meeting to be held on January 22, 1930, for their authorization and consent.

Changes in Funded Debt

The changes in the funded debt of the company, in detail, were as follows:

The amount on December 31, 1928 has been increased as follows:		$627,268,271.31
N. Y. C. R. R. Equipment Trust of 1929 4½ per cent certificates dated April 15, 1929		16,500,000.00
N. Y. C. R. R. Second Equipment Trust of 1929 4½ per cent certificates dated December 1, 1929		5,895,000.00
		$649,663,271.31
and has been reduced as follows:		
Mortgage on real estate in the City of New York paid	$16,000.00	
Payments falling due during the year and on January 1, 1930, on the company's liability for principal installments under equipment trust agreements as follows:		
N. Y. C. R. R. Co. Trust of 1917, January 1, 1930	1,117,000.00	
Trust No. 43 of January 15, 1920, January 15, 1929	922,700.00	
N. Y. C. R. R. Co. Trust of 1920, April 15, 1929	1,153,167.33	
N. Y. C. Lines Trust of 1922, June 1, 1929	572,000.00	
N. Y. C. Lines 4½ per cent Trust of 1922, September 1, 1929	569,000.00	
N. Y. C. Lines Trust of June 1, 1923, June 1, 1929	462,000.00	
N. Y. C. Lines Trust of 1924, June 1, 1929	983,000.00	
N. Y. C. Lines 4½ per cent Trust of 1924, September 15, 1929	848,000.00	
N. Y. C. Lines Trust of 1925, May 15, 1929	734,000.00	7,376,867.33
leaving the funded debt on December 31, 1929 an increase of $15,018,132.67.		$642,286,403.98

New York Central Railroad Equipment Trust of 1929

This trust was established by agreement dated April 15, 1929, and there were issued thereunder $16,500,000 of 4½ per cent equipment trust certificates maturing in equal annual installments of $1,100,000 in the years 1930-1944, inclusive, and representing approximately 75 per cent of the cost of equipment leased by the Trustee to this company. The equipment included in the trust, costing approximately $22,293,436, consists of 125 Mohawk freight locomotives, 10 Hudson passenger locomotives, 1,500 steel box cars, 700 steel automobile box cars, 500 hopper cars, 1,540 gondola cars, 300 steel flat cars, 30 milk cars, 20 steel baggage cars and 10 steel combination passenger and baggage cars.

New York Central Railroad Second Equipment Trust of 1929

This trust was established by agreement dated December 1, 1929. Under the trust a total of $11,175,000 of 4½ per cent equipment trust certificates are issuable, of which there were issued during the year $5,895,000, maturing in equal annual installments of $393,000 in the years 1930-1944, inclusive, and representing approximately 75 per cent of the cost of equipment leased by the Trustee to this company. This equipment, costing approximately $7,876,130, consists of 30 Hudson passenger locomotives, 25 Mohawk freight locomotives, 600 automobile box cars, 460 gondola cars and 10 steel dining cars.

Proposed Leases of Lines of Controlled Companies

By orders dated July 2, 1929, and December 2, 1929, the Interstate Commerce Commission authorized the leasing by this company for a term of 99 years of the lines of railroad and properties of The Cleveland Cincinnati Chicago and St. Louis Railway Company, The Michigan Central Railroad Company and Chicago Kalamazoo and Saginaw Railway Company and the lessor companies' leased lines, including in the case of The Cleveland Cincinnati Chicago and St. Louis Railway Company the lines and properties to be leased to it by The Cincinnati Northern Railroad Company and Evansville Indianapolis & Terre Haute Railway Company. On December 11, 1929, the Executive Committee adopted a resolution approving the making effective of the proposed leases on February 1, 1930.

Pensions

During the year 511 employees were retired and pensioned: 260 at the age of seventy, 185 for disability and 66 voluntarily on service pension. There were 3,186 pensioners at the close of the year, as compared with 3,062 at the end of 1928. The total amount paid in pensions for the year was $1,981,308.17.

Valuation of the Company's Property by the Interstate Commerce Commission

On November 26, 1929, the Interstate Commerce Commission issued its final valuation of the lines comprising the New York Central System. These valuations are of various dates from June 30, 1915, to June 30, 1919. The enginering costs are based on 1914 prices which are to be revised when the valuations are brought down to later dates. The values attributed to lands are of the respective valuation dates.

The total valuation of the used transportation property of the system upon which the return to the carriers is based is $1,578,206,614. This is $28,039,640 in excess of the tentative valuations. The total of the valuations for the system as a whole also exceeds the total of the investment accounts as of the corresponding dates.

Appropriate reservations of all rights in controversial matters have been made by the companies. Obviously there can be no occasion for any assertion of rights reserved until the valuations are brought down to later dates.

Changes in Organization

The Board records with regret the death of the following:

January 29, 1929, Ogden Mills, associated with the company as a director of the company and its predecessor since March 11, 1914. Mr. Mills was also a director of The New York and Harlem Railroad Company and West Shore Railroad Company.

October 3, 1929, John L. Burdett, Vice President. Mr. Burdett served the company and its predecessors continuously for nearly sixty years. Prior to his appointment as Vice President in 1922, he had served as paymaster for many years.

November 1, 1929, Sylvester S. Bliss, Assistant Treasurer.

November 6, 1929, Robert J. Cary, Vice President and General Counsel. Mr. Cary was appointed General Counsel of the company in 1920. His jurisdiction was later extended over all New York Central Lines and on June 1, 1927, he was appointed Vice President and General Counsel.

The Board records the election on March 13, 1929, of Gordon Abbott to fill the vacancy caused by the death of Ogden Mills.

The following appointments were made:

October 1, 1929, James H. Hustis, Vice President; Malcolm R. Connell, Vice President;

November 1, 1929, Gustave H. Howe, Assistant Treasurer.

November 6, 1929, Charles C. Paulding, Vice President, Law and Public Relations; Jacob Aronson, General Counsel; Sidney C. Murray, General Counsel; and Crosby J. Beakes, Assistant General Counsel.

The Board wishes to express its appreciation of the loyal and efficient service of the officers and employees of the company during the year.

For the Board of Directors,
P. E. Crowley,
President.

[Advertisement]

Michigan Central Railroad Company—Annual Report

To the Stockholders of

THE MICHIGAN CENTRAL RAILROAD COMPANY:

The Board of Directors herewith submits its report for the year ended December 31, 1929, with statements showing the income account for the year and the financial condition of the company.

The Year's Business

During 1929, the company moved 32,792,343 tons of revenue freight, an increase as compared with 1928 of 691,446 tons, largely the result of a heavier movement of coal, coke and manufactured articles.

Revenue passengers carried were 3,563,176, an increase of 42,637. Interline passengers decreased 21,963, while local and commutation passengers increased 64,600.

Income Account for the Year

	Year ended Dec. 31, 1929	Year ended Dec. 31, 1928	+ Increase or — Decrease
OPERATING INCOME			
	1,858.34 *miles operated*	1,858.42 *miles operated*	—.08 *mile*
RAILWAY OPERATIONS			
Railway operating revenues	$94,718,966.52	$93,217,493.20	+$1,501,473.32
Railway operating expenses	64,865,394.56	62,643,935.11	+ 2,221,459.45
NET REVENUE FROM RAILWAY OPERATIONS	$29,853,571.96	$30,573,558.09	— $719,986.13
Percentage of expenses to revenues	(68.48)	(67.20)	+ (1.28)
Railway tax accruals	$6,392,709.84	$6,327,936.69	+ $64,773.15
Uncollectible railway revenues	15,378.24	25,064.20	— 9,685.96
RAILWAY OPERATING INCOME	$23,445,483.88	$24,220,557.20	— $775,073.32
Equipment rents, net debit	$918,125.46	$513,355.81	+ $404,769.65
Joint facility rents, net debit	628,981.91	551,234.13	+ 77,747.78
NET RAILWAY OPERATING INCOME	$21,898,376.51	$23,155,967.26	—$1,257,590.75
MISCELLANEOUS OPERATIONS			
Revenues	$397,209.51	$403,831.95	— $6,622.44
Expenses and taxes	342,773.39	342,445.30	+ 328.09
MISCELLANEOUS OPERATING INCOME	$54,436.12	$61,386.65	— $6,950.53
TOTAL OPERATING INCOME	$21,952,812.63	$23,217,353.91	—$1,264,541.28
NON-OPERATING INCOME			
Income from lease of road	$249.35	$278.04	— $28.69
Miscellaneous rent income	290,829.60	327,663.24	— 36,833.64
Miscellaneous non-operating physical property	52,989.24	73,525.62	— 20,536.38
Dividend income	1,752,487.57	811,029.99	+ 941,457.58
Income from funded securities	299,847.47	323,999.33	— 24,151.86
Income from unfunded securities and accounts	705,984.96	480,742.61	+ 225,242.35
Miscellaneous income	12,404.50	15,125.89	— 2,721.39
TOTAL NON-OPERATING INCOME	$3,114,792.69	$2,032,364.72	+$1,082,427.97
GROSS INCOME	$25,067,605.32	$25,249,718.63	— $182,113.31
DEDUCTIONS FROM GROSS INCOME			
Rent for leased roads	$2,733,894.44	$2,736,593.38	— $2,698.94
Miscellaneous rents	6,417.23	4,158.76	+ 2,258.47
Miscellaneous tax accruals	81,577.51	64,361.92	+ 17,215.59
Interest on funded debt	2,748,069.61	2,890,543.66	— 142,474.05
Interest on unfunded debt	23,795.63	14,194.71	+ 9,600.92
Amortization of discount on funded debt	131,088.63	141,549.60	— 10,460.97
Maintenance of investment organization	2,084.64	1,883.19	+ 201.45
Miscellaneous income charges	5,563.00	7,013.54	— 1,450.54
TOTAL DEDUCTIONS FROM GROSS INCOME	$5,732,490.69	$5,860,298.76	— $127,808.07
NET INCOME	$19,335,114.63	$19,389,419.87	— $54,305.24
Per cent to capital stock outstanding	(103.20)	(103.49)	— (.29)
DISPOSITION OF NET INCOME			
Dividends declared: 40 per cent each year	$7,494,560.00	$7,494,560.00	.....
SURPLUS FOR THE YEAR CARRIED TO PROFIT AND LOSS	$11,840,554.63	$11,894,859.87	— $54,305.24

Profit and Loss Account

BALANCE TO CREDIT OF PROFIT AND LOSS, DECEMBER 31, 1928		$93,731,696.99
ADDITIONS:		
Surplus for the year 1929	$11,840,554.63	
Profit on property sold	868,623.37	
Unrefundable overcharges	33,171.96	12,742,349.96
		$106,474,046.95
DEDUCTIONS:		
Dividend appropriations of surplus	$18,736,400.00	
Depreciation prior to July 1, 1907, on equipment retired during the year	87,782.59	
Loss on property retired	119,439.59	
Miscellaneous items and adjustments (net)	103,212.59	19,046,834.77
BALANCE TO CREDIT OF PROFIT AND LOSS, DECEMBER 31, 1929		$87,427,212.18

Operating Revenues

Freight revenue amounted to $64,484,363.45, an increase of $386,219.78.

Passenger revenue was $19,883,089.83, an increase of $90,523.06.

Mail revenue was $1,653,641.35, an increase of $538,110.23.

Express revenue was $4,314,357.55, an increase of $274,729.14.

Switching revenue amounted to $1,802,695.86, an increase of $133,919.79.

Other transportation, incidental and joint facility revenues increased $77,971.32.

Operating Expenses

The following table shows the operating expenses by groups:

Group	Amount	Increase	Decrease
Maintenance of way and structures	$10,060,358.74	$66,896.80	
Maintenance of equipment	19,798,575.41	1,369,163.45	
Traffic	1,657,291.53	57,702.86	
Transportation	29,916,401.02	501,503.33	
Miscellaneous	1,437,396.73	161,981.14	
General	2,092,332.22	90,799.55	
Transportation for investment—credit	96,961.09		$26,587.68
Total	$64,865,394.56	$2,221,459.45	

The principal outlay contributing to the increase in expense for maintenance of way and structures is for the removal of snow and ice, the result of the severe weather in December, 1929. There were partially offsetting decreases in charges for application of track material and for maintenance of bridges, trestles and culverts.

The increase of $1,369,163.45 in expense for maintenance of equipment is largely in freight car repairs. The number of freight cars repaired increased from 698,672 in 1928 to 787,483 in 1929.

Traffic expenses increased $57,702.86, chiefly in expense of off line representation.

Transportation expenses were $501,503.33 more than for 1928, mainly due to the handling of a larger volume of traffic.

The increase of $161,981.14 in expenses for miscellaneous operations is chiefly due to additional dining cars operated in regular and special service.

The increase of $90,799.55 in general expenses is mainly the result of larger charges to the pension account and for valuation work prescribed by the Interstate Commerce Commission.

Net Income Before Dividends

The net income of the company was $19,335,114.63, a decrease of $54,305.24.

Dividends

Dividends declared and charged against the income of the year were as follows:

Date declared	Date payable	Rate per cent	Amount
June 12, 1929	July 29, 1929	20	$3,747,280.00
December 11, 1929	January 29, 1930	20	3,747,280.00
	Total for the year	40	$7,494,560.00

An extra dividend of 100 per cent, amounting to $18,736,400, was declared March 13, 1929, payable March 28, 1929, and was charged against the accumulated surplus of the company.

Capital Stock

The capital stock of the company remained unchanged during the year, the total amount authorized and issued being $18,738,000, including $1,600 held by the company.

Changes in Funded Debt

The changes in the funded debt of the company, in detail, were as follows:

The amount on December 31, 1928 has been increased as follows:	$64,461,653.25
Refunding and improvement mortgage bonds, Series C, issued to refund and retire a like amount of twenty-year 4 per cent gold debentures which matured April 1, 1929	7,634,000.00
	$72,095,653.25

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and has been reduced as follows:

Twenty-year 4 per cent gold debentures, due April 1, 1929		$7,634,000.00
By payments falling due during the year on the company's liability for principal installments under Equipment Trust Agreements as follows:		
M C R R Trust of 1915, October 1, 1929	300,000.00	
M C R R Trust of 1917, March 1, 1929	600,000.00	
M C R R Co proportion of N Y C R R Co Trust of 1920, April 15, 1929	467,664.75	
N Y C Lines Trust of 1922, June 1, 1929	373,000.00	
N Y C Lines 4½ per cent Trust of 1922, September 1, 1929	51,000.00	
N Y C Lines Trust of 1923, June 1, 1929	632,000.00	
N Y C Lines Trust of 1924, June 1, 1929	233,000.00	
N Y C Lines 4½ per cent Trust of 1924, September 15, 1929	173,000.00	
N Y C Lines 4½ per cent Trust of May 15, 1925, May 15, 1929	234,000.00	10,697,664.75

leaving the funded debt on December 31, 1929, $61,397,988.50

Issue of Refunding and Improvement Mortgage Bonds, Series C

In order to provide for the payment and refunding of $7,634,000 of the company's twenty-year four per cent gold debentures of 1909, which matured April 1, 1929, the company issued during the year $7,634,000 of its 4½ per cent refunding and improvement mortgage bonds of series C, dated January 1, 1929, due January 1, 1979, Series C of bonds under the refunding improvement mortgage having been created by resolution of the Board of Directors of the company adopted on March 13, 1929.

Proposed Lease of the Company's Properties to The New York Central Railroad Company

By orders dated July 2, 1929, and December 2, 1929, the Interstate Commerce Commission authorized the leasing by this company of its lines of railroad and properties, including its leased lines, to The New York Central Railroad Company for a term of 99 years, the lease providing for annual rental dividends of $50 per share upon the stock of this company now owned by The New York Central Railroad Company. On December 11, 1929, the Executive Committee adopted a resolution approving the making effective of the proposed lease on February 1, 1930.

Pensions

During the year 94 employees were retired and pensioned; 43 at the age of seventy, 32 for disability, and 19 voluntarily on service pension. There were 740 pensioners at the close of the year. The total amount paid in pensions for the year was $474,700.16.

Changes in Organization

The Board records with regret the death on October 3, 1929, of John L. Burdett, Vice President; and on November 6, 1929, of Robert J. Cary, Vice President and General Counsel.

The following appointments were made:

October 1, 1929, James H. Hustis, Vice President; Malcolm R. Connell, Vice President;

November 6, 1929, Charles C. Paulding, Vice President, Law and Public Relations.

The Board wishes to express its appreciation of the loyal and efficient service of the officers and employees of the company during the year.

For the Board of Directors,

P. E. CROWLEY,
President.

The Cleveland, Cincinnati, Chicago & St. Louis Railway Company

To the Stockholders of

THE CLEVELAND CINCINNATI CHICAGO AND ST. LOUIS RAILWAY COMPANY:

The Board of Directors herewith submits its report for the year ended December 31, 1929, with statements showing the income account and the financial condition of the company.

The Year's Business

The total operating revenues were $91,981,899.69, an increase of $3,151,747.29.

The company moved 45,945,308 tons of revenue freight, an increase of 1,124,596 tons as compared with 1928. Freight originating on the company's line increased 1,254,463, while that received from connecting carriers decreased 129,867 tons.

Freight revenue was $69,578,699.56, an increase of $1,984,406.13.

Revenue passengers carried were 3,252,991, a decrease of 342,212, of which 46,047 were interline, 167,475 local and 128,690 commutation.

Passenger revenue amounted to $13,996,275.49, a decrease of $562,080.74, divided: Interline passengers $246,089.04, local passengers $306,891.55, commutation passengers $9,100.15.

Mail revenue was $2,945,562.37, an increase of $1,068,507.31.

Express revenue was $2,578,011.34, an increase of $17,244.41.

Milk revenue decreased $31,321.86.

Other transportation, incidental and joint facility revenues amounted to $2,788,530.89, an increase of $674,992.04. There were increases in revenues from switching and demurrage, due to a greater volume of traffic. Joint facility revenues increased $574,222.63, due to adjustment made in 1928 in connection with the operation of the Louisville & Jeffersonville Bridge and Railroad Company and to increased revenues incident to the operation of Union Station at Indianapolis.

Income Account for the Year

	Year ended Dec. 31, 1929 2,398.96 *miles operated*	Year ended Dec. 31, 1928 2,397.25 *miles operated*	+ Increase or — Decrease +1.71 *miles*
OPERATING INCOME			
RAILWAY OPERATIONS			
Railway operating revenues	$91,981,899.69	$88,830,152.40	+$3,151,747.29
Railway operating expenses	69,624,282.57	66,989,154.90	+ 2,635,127.67
NET REVENUE FROM RAILWAY OPERATIONS	$22,357,617.12	$21,840,997.50	+ $516,619.62
Percentage of expenses to revenues	(75.69)	(75.41)	+ (.28)
Railway tax accruals	$5,339,342.21	$4,928,865.04	+ $410,477.17
Uncollectible railway revenues	$19,866.58	$16,208.37	+ $3,658.21
RAILWAY OPERATING INCOME	$16,998,408.33	$16,895,924.09	+ $102,484.24
Equipment rents, net debit	$450,465.27	$847,294.35	— $396,829.08
Joint facility rents, net debit	627,148.64	426,092.15	+ $201,056.49
NET RAILWAY OPERATING INCOME	$15,920,794.42	$15,622,537.59	+ $298,256.83
MISCELLANEOUS OPERATIONS			
Revenues	$14,498.08	$12,509.03	+ $1,989.05
Expenses and taxes	19,078.49	17,254.63	+ 1,823.86
MISCELLANEOUS OPERATING DEFICIT	$4,580.41	$4,745.60	— $165.19
TOTAL OPERATING INCOME	$15,916,214.01	$15,617,791.99	+ $298,422.02
NON-OPERATING INCOME			
Miscellaneous rent income	$278,261.02	$289,191.29	— $10,930.27
Miscellaneous non-operating physical property	166,846.35	163,000.90	+ $3,845.45
Separately operated properties—profit	7,326.42	1,986.48‡*	+ 9,312.90
Dividend income	665,953.90	387,656.40	+ 278,297.50
Income from funded securities	849,861.30	551,579.19	+ 298,282.11
Income from unfunded securities and accounts	354,847.81	556,338.59	— 201,490.78
Release of premiums on funded debt	65.00	223.15	— 158.15
Miscellaneous income	14,059.21	23,942.88	— 9,883.67
TOTAL NON-OPERATING INCOME	$2,337,221.01	$1,969,945.92*	+ $367,275.09
GROSS INCOME	$18,253,435.02	$17,587,737.91*	+ $665,697.11
DEDUCTIONS FROM GROSS INCOME			
Rent for leased roads	$472,152.62	$417,510.71	+ $54,641.91
Miscellaneous rents	202,824.44	198,272.67	+ 4,551.77
Miscellaneous tax accruals	46,074.04	75,050.00	— 28,975.96
Separately operated properties—loss	73,027.38	90,237.79*	— 17,210.41
Interest on funded debt	8,002,910.59	7,697,785.93	+ 305,124.66
Interest on unfunded debt	20,996.18	18,343.31	+ 2,652.87
Amortization of discount on funded debt	202,011.95	252,400.18	— 50,388.23
Maintenance of investment organization	735.97	527.57	+ 208.40
Miscellaneous income charges	16,713.98	17,786.58	— 1,072.60
TOTAL DEDUCTIONS FROM GROSS INCOME	$9,037,447.15	$8,767,914.74*	+ $269,532.41
NET INCOME	$9,215,987.87	$8,819,823.17	+ $396,164.70

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	Year ended Dec. 31, 1929	Year ended Dec. 31, 1928	+ Increase or — Decrease
Per cent on the common stock—outstanding after preferred dividends	(18.53)	(17.69)	(.84)
DISPOSITION OF NET INCOME			
Dividends declared			
On preferred stock, 5 per cent each year	$499,925.00	$499,925.00	
On common stock, 8 per cent each year	3,762,304.00	3,762,304.00	
Sinking funds	53,991.78	51,700.44	+ $2,291.34
TOTAL APPROPRIATIONS OF INCOME	$4,316,220.78	$4,313,929.44	+ $2,291.34
SURPLUS FOR THE YEAR CARRIED TO PROFIT AND LOSS	$4,899,767.09	$4,505,893.73	+ $393,873.36

‡ Deficit
* Restated for comparative purposes

Profit and Loss Account

BALANCE TO CREDIT OF PROFIT AND LOSS DECEMBER 31, 1928		$59,685,866.84
ADDITIONS:		
Surplus for the year 1929	$4,899,767.09	
Profit on sale of land	121,774.19	
Unrefundable overcharges	14,609.05	
Donations	13,879.11	
Reacquirement of securities below par	12,866.50	5,062,895.94
		$64,748,762.78
DEDUCTIONS:		
Surplus appropriated for investment in physical property	$106,974.20	
Loss on property retired	258,682.49	
Amount previously carried as advances to Cincinnati Lafayette and Chicago Railroad Company	242,472.05	
Uncollectible accounts and miscellaneous items (net)	13,316.80	621,445.54
BALANCE TO CREDIT OF PROFIT AND LOSS, DECEMBER 31, 1929		$64,127,317.24

Operating Expenses

Operating expenses, by groups, were as follows:

Group	Amount	Comparison	
Maintenance of way and structures	$10,283,850.39	$392,658.25	Increase
Maintenance of equipment	20,093,486.16	1,039,948.81	Increase
Traffic	1,909,127.54	75,931.80	Increase
Transportation	33,466,816.90	998,383.57	Increase
Miscellaneous operations	1,112,655.29	92,273.85	Increase
General	2,872,359.63	79,544.09	Increase
Transportation for investment—credit	114,013.34	43,612.70	Decrease
	$69,624,282.57	$2,635,127.67	Increase

The larger items contributing to the increase in expense for maintenance of way and structures are flood damages and prevention, removing snow and ice, due to unusual snow storms in 1929, expense in connection with Riverside, Ohio, improvements and amounts paid for maintenance of joint facilities.

The increase in expense for maintenance of equipment is due to an extensive program of repairs and renewals of freight and passenger cars, to increased charges for depreciation, and to an increase in locomotive retirements.

The increase in traffic expenses is due largely to the extension of the company's representation in off line territory.

The increase in transportation expenses is mainly in wages of yard, train and engine men, due to increased traffic and adverse weather conditions, to extension of operations in the Cleveland district and to increased cost of operating joint yards and terminals.

The cost of miscellaneous operations increased $92,273.85, due to the extension of dining car service.

The increase in general expenses is found in greater charges for pensions and in addition to clerical forces made necessary by valuation requirements of the Interstate Commerce Commission.

Net Income Before Dividends and Other Appropriations

The net income of the company was $9,215,987.87, an increase of $396,164.70.

Dividends

Dividends declared and charged against net income of the year were as follows:

Preferred stock:

Date declared	Date payable	Rate per cent	Amount
March 13, 1929	April 20, 1929	1¼	$124,981.25
June 12, 1929	July 20, 1929	1¼	124,981.25
September 11, 1929	October 19, 1929	1¼	124,981.25
December 11, 1929	January 20, 1930	1¼	124,981.25
	Total	5	$499,925.00

Common stock:

Date declared	Date payable	Rate per cent	Amount
March 13, 1929	April 20, 1929	2	$940,576.00
June 12, 1929	July 20, 1929	2	940,576.00
September 11, 1929	October 19, 1929	2	940,576.00
December 11, 1929	January 20, 1930	2	940,576.00
	Total	8	$3,762,304.00

Changes in Funded Debt

The changes in the funded debt of the company, in detail, were as follows:

The amount on December 31, 1928 $164,424,385.74

has been reduced as follows:

Bonds retired or purchased for sinking fund during the year:		
C I St L & C Ry Co general first mortgage bonds purchased and cancelled	$118,000.00	
C I St L & C Ry Co general first mortgage bonds retired through sinking fund	59,000.00	
C C C & Ct L Ry Co (St Louis Division) first collateral trust mortgage bonds purchased for sinking fund	61,000.00	
C C C & St L Ry Co refunding and improvement bonds, Series A, due July 1, 1929	15,000,000.00	
Payments falling due during the year on the company's liability for principal installments under equipment trust-agreements as follows:		
Big Four Railway Trust of 1914, June 1, 1929	373,000.00	
Big Four Railway Trust of 1915, July 1, 1929	115,000.00	
Equipment Trust No. 44 (1920), January 15, 1929	346,700.00	
N Y C R R Co Trust of 1920, April 15, 1929	761,111.40	
N Y C Lines Trust of 1922, June 1, 1929	375,000.00	
N Y C Lines 4½ per cent Trust of 1922, September 1, 1929	224,000.00	
N Y C Lines Trust of 1923, June 1, 1929	62,000.00	
N Y C Lines Trust of 1924, June 1, 1929	427,000.00	
N Y C Lines 4½ per cent Trust of 1924, September 15, 1929	376,000.00	
N Y C Lines 4½ per cent Trust of 1925, May 15, 1929	532,000.00	18,829,811.40

leaving the funded debt on December 31, 1929 $145,594,574.34

Proposed Lease of the Company's Properties, Including Transfer of Its Proposed Leases of The Cincinnati Northern Railroad Company and Evansville, Indianapolis & Terre Haute Railway Company, to The New York Central Railroad Company

By orders dated July 2, 1929, and December 2, 1929, the Interstate Commerce Commission authorized the taking by this company of leases of the lines of railroad and properties of The Cincinnati Northern Railroad Company and of the Evansville Indianapolis & Terre Haute Railway Company, and the transfer of the lines of railroad and properties of this company and its leased lines, including the Cincinnati Northern Railroad and Evansville Indianapolis & Terre Haute Railway, to The New York Central Railroad Company, under ninety-nine year lease providing for annual rental dividends of $5 per share upon the preferred stock and $10 per share upon the common stock of this company not owned by The New York Central Railroad Company. On December 11, 1929, the Executive Committee adopted a resolution approving the making effective of the proposed leases on February 1, 1930.

Changes in Organization

The Board records with regret the death on October 3, 1929, of John L. Burdett, Vice President, and on November 6, 1929, of Robert J. Cary, Vice President and General Counsel of the company.

The following appointments were made:

October 1, 1929, James H. Hustis, Vice President, Malcolm R. Connell, Vice President.

November 6, 1929, Charles C. Paulding, Vice President, Law and Public Relations.

The Board wishes to express its appreciation of the loyal and efficient service of the officers and employees of the company during the year.

For the Board of Directors,

P. E. CROWLEY,
President.

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Financial News

(*Continued from page 1493*)

mortgage 5 per cent, series B, bonds to reimburse its treasury for capital expenditures made upon the property of the Rio Grande Junction Railway.

DENVER & RIO GRANDE WESTERN.—*Van Sweringen Directors Authorized to Serve.*—The Interstate Commerce Commission has authorized O. P. Van Sweringen and other directors representing the Van Sweringen interests who were recently elected directors of the Missouri Pacific to serve also as directors of the D. & R. G. W. and other companies affiliated with the Missouri Pacific.

GULF, MOBILE & NORTHERN.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to sell $3,000,000 of 5 per cent bonds, part of an issue authorized by the commission on December 2, 1929.

NEW YORK CENTRAL.—*Equipment Trust.*—The Interstate Commerce Commission has authorized this company to assume obligation and lability in respect of $3,945,000 of its 4½ per cent equipment trust of 1930 certificates, to mature in installments from 1931 to 1945. The issue is authorized for sale to the highest bidder, Salomon Bros. & Hutzler, at 99.71, which will make the average annual cost to the railroad 4.5456 per cent.

PENNSYLVANIA.—*Acquisition.*—The Interstate Commerce Commission has authorized the Elmira & Lake Ontario, a P. R. R. lessor line, to acquire control of the Marion Railway Corporation by purchase of its capital stock. The Marion extends from a connection with the Elmira & Lake Ontario at Newark, N. J., northwesterly to Marion, approximately 8.4 miles.

READING.—*Equipment Trust.*—The Interstate Commerce Commission has authorized this company to assume obligation and liability in respect of $7,080,000 of its 4½ per cent, series M, equipment trust certificates, to mature in installments between 1930 and 1945. The issue is authorized for sale to the highest bidder, Edward Lowber Stokes & Co., at 99.8375, which will make the average annual cost to the railroad approximately 4.5263 per cent.

SAVANNAH & ATLANTA.—*Acquisition and Securities.*—The Interstate Commerce Commission has authorized the the Savannah & Atlanta Railway Company to acquire and operate the line of railroad formerly owned and operated by the Savannah & Atlanta Railway, or its receiver. The new company is authorized to issue 23,500 shares of common stock without par value, $1,250,000 of preferred stock and $1,300,000 of first mortgage 6 per cent, Series A, bonds. It is planned to offer $1,000 of new first mortgage bonds and 5 shares of common stock for each $1,000 of Brinson Railway (a predecessor company) bonds and $200 of new first mortgage bonds and one share of common stock for each $1,000 of the old company's bonds. The proposed issue of first mortgage bonds and the 6,500 shares of common stock will take care of the requirements in this connection. The new bonds will bear interest at 6 per cent and are authorized for sale at not less than 95.

SEABOARD AIR LINE.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $653,000 of its 4 per cent refunding mortgage bonds to be pledged with its corporate trustee for its first and consolidated mortgage and to issue $629,500 of first and consolidated bonds, series A, to be pledged and repledged as security for short time loans.

SOUTHERN.—*Bonds.*—The Interstate Commerce Commission has authorized this company to issue $3,106,000 of its 5 per cent first consolidated mortgage bonds, maturing in 1994. The issue is authorized for sale to J. P. Morgan & Co. at 108, making the average annual cost to the railroad approximaetly 4.61 per cent.

TENNESSEE & NORTH CAROLINA.—*Acquisition.*—The Interstate Commerce Commission has authorized the Smoky Mountain, a lessor line of the Tennessee & North Carolina, to acquire a 1.2-mile line of railroad in Sevierville, Tenn. The line to be so acquired is the unabandoned part of the Pigeon River Railroad.

TOLEDO TERMINAL.—*Bonds.*—The Interstate Commerce Commission has authorized this company to sell to the American Bridge Company a $50,000 first mortgage 4½ per cent bond at 96, which will make the annual cost to the railroad approximately 4.16 per cent. The bond will be accepted by the bridge company in partial payment for the construction of a bridge for the railroad.

Average Prices of Stocks and of Bonds

	June 17	Last week	Last year
Average price of 20 representative railway stocks.	116.41	122.66	137.28
Average price of 20 representative railway bonds..	94.04	93.83	90.26

Dividends Declared

Beech Creek.—$.50, quarterly, payable July 1 to holders of record June 13.

Belgian National Railways.—Preferred, 2 per cent, payable June 7 to holders of coupon No. 3.

Canada Southern.—1½ per cent, semi-annually, payable August 1 to holders of record June 27.

Chicago, Indianapolis & Louisville.—Common, 2½ per cent; Common Extra, 1 per cent; Preferred, 2 per cent, all payable July 10 to holders of record June 24.

Cincinnati Union Terminal.—Preferred, 1¼ per cent, quarterly, payable July 1 to holders of record June 20.

Mahoning Coal R. R.—Common, $12.50, quarterly, payable August 1 to holders of record July 14; Preferred, $1.25, payable July 1 to holders of record June 23.

Mobile & Ohio.—3½ per cent, semi-annually, payable June 30 to holders of record June 23.

New York Central.—2 per cent, quarterly, payable August 1 to holders of record June 27.

New York & Harlem.—Common and Preferred, $2.50, payable July 1 to holders of record June 13.

Northern Central,—2 per cent, payablle July 15 to holders of record June 30.

Pennroad Corp.—Initial, $.20, payable September 15 to holders of record August 8.

Pittsburgh & Lake Erie.—$2.50, payable August 1 to holders of record June 27.

Pittsburgh, McKeesport & Youghiogheny.—$1.50, payable July 1 to holders of record June 13.

Southern Railway.—Common, 2 per cent, quarterly, payable August 1 to holders of record July 1; Preferred, 1¼ per cent, quarterly, payable July 15 to holders of record June 23.

Railway Officers

Executive

Horace H. Durston has been appointed executive general agent of the Fort Worth & Denver City and the Wichita Valley, with headquarters at Fort Worth, Tex.

W. S. Boyd, general manager of the Ray & Gila Valley, has been elected vice-president in charge of operation, with headquarters as before at San Francisco, Cal.

J. Q. VanWinkle, assistant to the vice-president of the Cleveland, Cincinnati, Chicago & St. Louis, with headquarters at Indianapolis, Ind., has retired from active duty after 69 years of service with the Big Four and the companies of which it is now a part.

Golder Shumate, general freight traffic manager of the Baltimore & Ohio, with headquarters at Baltimore, Md., has been elected vice-president in charge of freight, mail and express and commercial development departments with the same headquarters, succeeding **Archibald Fries,** deceased.

F. DeP Landa, advisor to the organization committee of the National Railways of Mexico, with headquarters at Mexico, D. F., has been appointed vice-president and general manager in charge of operation, succeeding **M. Cabrera,** who has resigned. **L. Perez Castro,** a member of the organization committee, has been appointed assistant to the executive vice-president, with supervision over all activities of the National Railways other than operation, and with headquarters at Mexico.

Financial, Legal and Accounting

A. J. Roaghan has been elected secretary and **Erle V. Daveler** has been elected treasurer of the Nevada Northern and the Ray & Gila Valley, with headquarters at New York.

George W. Lamb, whose appointment as general auditor of the Atlantic Coast Line at Wilmington, N. C., was announced in the *Railway Age* of June 7, page 1403, was born on December 23, 1875, at Bellevue, Ky. He was educated in the public schools and entered railroad service in October, 1900, with the Louisville & Nashville, as a clerk in the office of the comptroller. Mr. Lamb was advanced through the various clerical positions and in 1910, he was appointed statistician. In 1911, he was promoted to second assistant comptroller and on November 1, 1916, to the position of first assistant comptroller. During federal control, he served as staff officer in charge of accounts, with headquarters at Atlanta, Ga., and when the railroads were returned to their owners he again entered the service of the

Louisville & Nashville as senior assistant comptroller at Louisville, Ky. On March 1, 1921, he was selected as general auditor of the Express Contract Accounting Committee, of the Association of Railway Executives, with headquarters at New York, N. Y. He organized bureaus at New York, Philadelphia, Pa., Chicago and Chattanooga, Tenn., for the purpose of checking the accounts of the American Railway Express Company on behalf of all the railroads of the country operating under

George W. Lamb

the uniform and amended uniform express contracts. He remained in this position until May 31, when he resigned to accept the position of general auditor of the Atlantic Coast Line.

Operating

Robert W. Thomas, general superintendent of the Ray & Gila Valley, has been promoted to general manager with headquarters as before at Ray, Ariz.

R. E. Loper, Jr., has been appointed general manager of the Kosciusko & Southeastern, with headquarters at Zama, Miss., succeeding **M. D. Thomason,** resigned.

J. R. Postlethwaite, trainmaster on the Chicago & Alton at Bloomington, Ill., has been appointed chief dispatcher at that point and the position of trainmaster has been abolished.

John B. Hamilton, superintendent of freight service of the Illinois Central, with headquarters at Chicago, has been promoted to superintendent of the Wisconsin division with headquarters at Freeport, Ill., succeeding **J. F. Dignan,** deceased.

John L. May, trainmaster on the Portland division of the Southern Pacific at Portland, Ore., retired from active duty on June 1 after 54 years of service in the operating department of that road. Mr. May became a telegraph operator on the Southern Pacific at the age of 16 years.

J. J. Rhoads, superintendent of the former Allegheny division of the Pennsylvania at Oil City, Pa., has been appointed assistant to the general superintendent of the Northern division. **H. E. Gilg,** acting assistant trainmaster of the Akron division, has been promoted to assistant trainmaster of that division. **L. M. Wolcott,** powerman on the Erie & Ashtabula division, has been promoted to assistant trainmaster on the Renovo division, succeeding **J. L. Snyder,** who has been transferred to the Panhandle division. **Howard Mellon,** assistant trainmaster on the Conemaugh division, has been transferred to the Pittsburgh division at Cresson, Pa., succeeding **D. A. Keirn,** who has been appointed train dispatcher. **Perry Johnson,** general yardmaster on the Pittsburgh division, has been promoted to assistant trainmaster on the Conemaugh division. **J. W. Masterson,** supervising agent and division operator of the former Allegheny division, has been appointed assistant trainmaster on the Buffalo division.

Clarence L. Grim, whose appointment as superintendent of car service of the Lehigh Valley at Bethlehem, Pa., was announced in the *Railway Age* of June 7, page 1403, was born at So. Bethlehem, Pa., on September 28, 1884, and was educated in public schools and at business college. He commenced his railway career in 1899, with the Lehigh Valley, as a clerk in the office of the superintendent of car service and transportation at So. Bethlehem, Pa. In 1914, he was transferred to Auburn, Pa., as chief clerk on the Auburn division. He returned to So. Bethlehem on September 1, 1916, as clerk to superintendent of transportation and remained there until July 31, 1918, serving successively as chief clerk and special agent. In August, 1918, he became assistant chief clerk to the superintendent of transportation at Bethlehem, Pa., and in April, 1923, he was promoted to chief clerk. On January 1, 1930, he was advanced to assistant to superintendent of transportation, the position he held until his recent promotion.

Jasper N. Haines, whose appointment as general superintendent of transportation of the Lehigh Valley at Bethlehem, Pa., was announced in the *Railway Age* of June 7, page 1403, was born at Pleasant Dale, W. Va., and was educated in the public schools and at Pittsburgh Academy. He commenced his railway career on July 8, 1892, with the Pittsburgh & Lake Erie as yard clerk at Turner, Pa., and until April 2, 1898, he served successively as stenographer and clerk to the trainmaster at Pittsburgh, Pa. On August 8, 1898, he entered the service of the Lehigh Valley as stenographer to the superintendent at Hazelton, Pa., and in May, 1902, he was appointed chief clerk. In July, 1903, he was transferred to Wilkes-Barre, Pa., as chief clerk to the superintendent of the Wyoming division. From October, 1904, to November, 1907, he served as clerk and later as chief clerk to the general manager at So. Bethlehem, Pa. On November 18, 1907, he was appointed inspector of transportation at So. Bethlehem, and on August 1, 1909 he became trainmaster at Auburn, Pa. From January 1, 1910, to June 30, 1914, he was assistant superintendent at Sayre, Pa., and on the latter date he was promoted to superintendent. Mr. Haines moved to Bethlehem on July 23, 1918, and until his recent promotion has served successively as assistant to operating assistant, assistant to general manager and superintendent of transportation.

W. M. Vandersluis, electrical engineer of the Chicago Terminal Improvement of the Illinois Central, has been promoted to general superintendent of telegraph and signals of the Illinois Central, with jurisdiction over fixed property in electrical service. Mr. Vandersluis has been connected with the Illinois Central for 16 years. He graduated from the University of Michigan in 1902 and entered railway service on the Pittsburgh, Fort Wayne & Chicago (now part of the Pennsylvania). Later he served for two years as a signal inspector on the Pennsylvania, Lines West. In 1906 he was appointed superintendent of signal construction on the Coast lines of the Southern Pacific. Later in the same year he was appointed signal engineer of the Cleveland, Cincinnati, Chicago & St. Louis and the Pittsburgh & Lake Erie. From 1907 to 1912 Mr. Vandersluis served in the Chicago office of the Union Switch & Signal Company and was then appointed signal engineer of the Illinois Central. During the World War he served as a captain in the Thirty-fifth Engineers at Camp Grant, and with the American Expedi-

W. M. Vandersluis

tionary Forces as a major in the Motor Transport service and signal engineer in the Transportation service. Upon his return to the United States he resumed the position of signal engineer of the Illinois Central and in 1921 he was appointed secretary of the Illinois Central Electrification Commission—Chicago terminals. He was appointed electrical engineer of the Chicago Terminal Improvement in 1926. His position to general superintendent of telegraph and signals became effective on June 10.

Traffic

J. E. Payne, assistant general agent for the St. Louis-San Francisco at Tulsa, Okla., has been promoted to assistant general passenger agent at the same point.

J. D. Riley, auditor of the Reader Railroad, with headquarters at Reader, Ark., has also been appointed traffic manager.

R. E. Larmour, general freight agent of the Canadian Pacific at Montreal, Que., has been appointed to supervise solicitation and handling of freight traffic in Canada and the United States, east of Port Arthur, Ont., and Grand Rapids, Mich. **A. Walker,** assistant general freight agent at Montreal, has been appointed general freight agent with supervision of rates and divisions on traffic between points in Canada and the United States interstate and intrastate, except transcontinental rates, and **D. W. Johnston,** chief of division bureau, has been appointed assistant general freight agent, succeeding Mr. Walker. **G. F. Buckingham,** chief clerk to the assistant freight traffic manager, will succeed Mr. Johnston as chief of division bureau.

Walton O. Wright, general passenger agent of the Boston & Maine at Boston, Mass., has been promoted to passenger traffic manager, succeeding **H. F. Fritch,**

Walton O. Wright

appointed director of budgets. **F. T. Grant,** passenger assistant to the vice-president in charge of co-ordinated rail and highway passenger transportation, has been promoted to general passenger agent.

Mr. Wright was born at Lynn, Mass., on June 8, 1890, and entered railway service on October 13, 1910, as a messenger in the freight traffic department of the Boston & Maine. He later served as a file clerk, general clerk, rate clerk, tariff compiling clerk, traveling freight agent and special assistant to the foreign freight agent. On May 1, 1920, Mr. Wright left railway service to become transportation manager of the Associated Industries of Massachusetts, re-entering railway service again on November 1, 1923, as assistant general freight and passenger agent for the Boston & Maine, with headquarters at Portland, Me. He was promoted to general passenger agent early in 1925, the position he vacates to become passenger traffic manager.

Mechanical

G. A. Rhoads, master mechanic of the former Allegheny division of the Pennsylvania at Oil City, Pa., has been appointed general foreman on the Buffalo division.

Harrie E. Myers, master mechanic of the Lehigh Valley, with headquarters at Buffalo, N. Y., has been appointed master car builder with headquarters at Bethlehem, Pa. Mr. Myers was born at St. Joseph, Mo., and in 1897 he

Harrie E. Myers

began his railway career in that city with the Chicago, Burlington & Quincy. After serving his regular apprenticeship he continued in the service of this road until 1903 when he became associated with the Union Pacific for a period of over two years. While with the Union Pacific he served in various capacities in the mechanical department. In July, 1905, he became general machine foreman of the Atchison, Topeka & Santa Fe, at Fort Madison, Iowa. In 1906, he accepted the position of shop inspector with the Lehigh Valley at Sayre, Pa. He was appointed assistant master mechanic at Easton, Pa., in 1912 and shop superintendent of the Packerton, Pa., car shops in 1913. From 1914 until his recent promotion, Mr. Myers served as master mechanic at Auburn, N. Y., Hazleton, Pa., and Buffalo, N. Y.

Lewis D. Freeman, assistant to chief mechanical officer of the Chesapeake & Ohio, with headquarters at Richmond, Va., has been promoted to assistant superintendent motive power at Huntington, W. Va. Mr. Freeman was born on July 11, 1888, at Gettysburg, Pa., and commenced his business career with the Baldwin Locomotive Works in 1905. In June, 1910, he entered railway service with the Baltimore & Ohio as draftsman in the office of the mechanical engineer and continued his connection with this road until December, 1912, when he accepted a position as chief draftsman with the Kansas City Southern at Pittsburg, Kan. In February, 1914, he entered the service of the Seaboard Air Line as shop superintendent at Portsmouth, Va., and in October,

Lewis D. Freeman

1919, he was promoted to assistant superintendent of motive power, with the same headquarters. From April, 1924, until his recent promotion he held the position of assistant to chief mechanical officer of the Chesapeake & Ohio at Richmond, Va.

Purchases and Stores

J. Arnott, assistant purchasing agent on the Canadian Pacific at Calgary, Alta., has been transferred to Winnipeg, Man., succeeding **C. Slater,** acting assistant purchasing agent, who has been appointed assistant purchasing agent at Quebec, Que. **R. H. Yarnell,** assistant purchasing agent at Quebec, has been transferred to Calgary, replacing Mr. Arnott.

Special

Joel L. Priest, Jr., has been appointed manager of the news bureau of the Los Angeles & Salt Lake at Los Angeles, Cal., succeeding **Robert B. Denton,** resigned.

Obituary

Robert A. Brand, a retired vice-president of the Atlantic Coast Line, died at Wilmington, N. C., on June 16, after a long illness.

John S. Dean, assistant division superintendent on the Northern Pacific at Tacoma, Wash., died in that city on June 4.

B. V. Somerville, assistant to the chief engineer of the Central region of the Pennsylvania, at Pittsburgh, Pa., died on June 7.

James N. Harrison, former general agent and special representative of the passenger department of the Southern Pacific Lines at San Francisco, Cal., died in that city on May 4.

Two Sections—Section Two

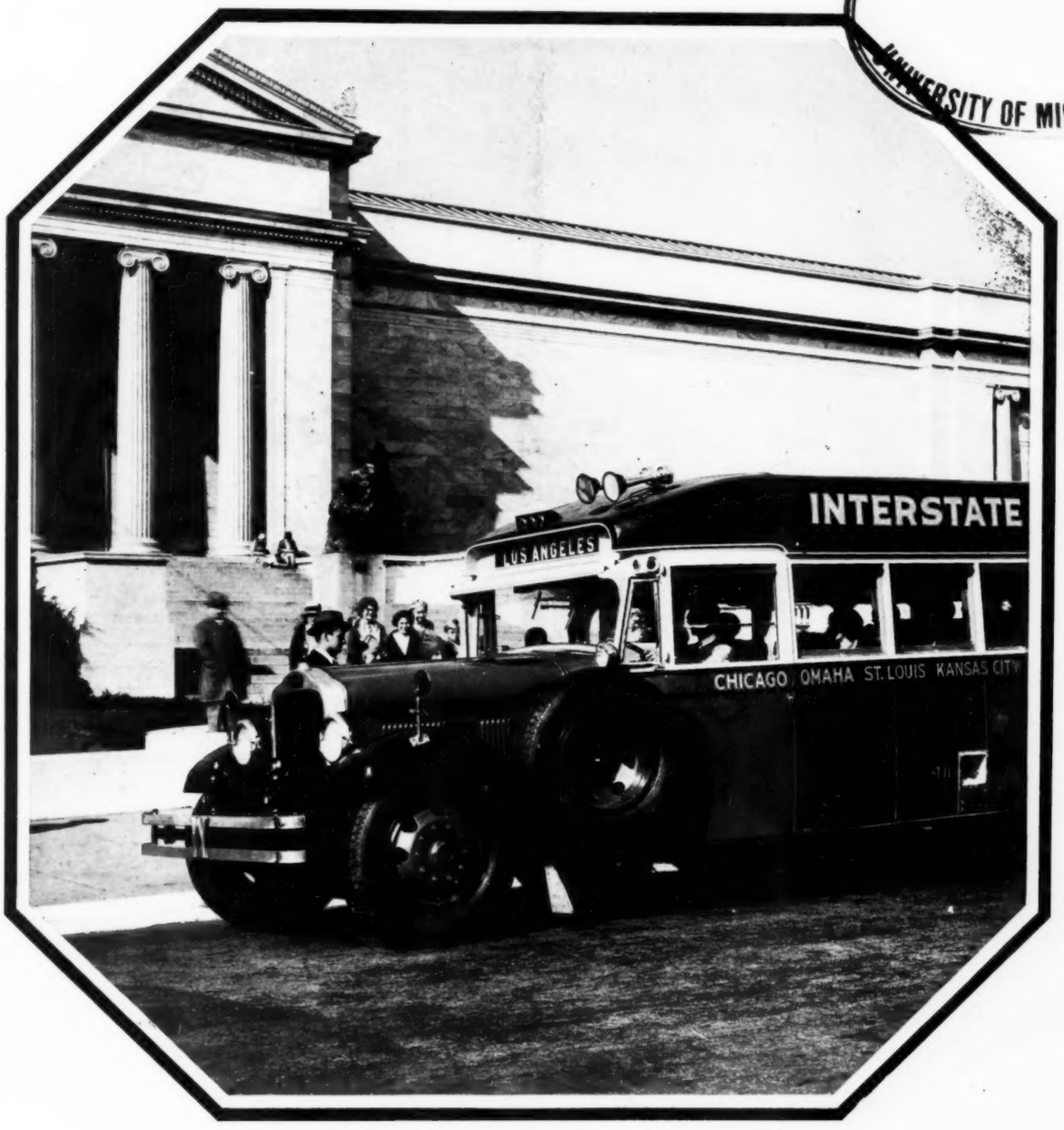
Railway Age

Motor Transport Section

Devoted to the Co-ordination of Railway and Highway Service

JUNE 21, 1930

TRANSPORTATION LIBRARY
UNIVERSITY OF MICHIGAN



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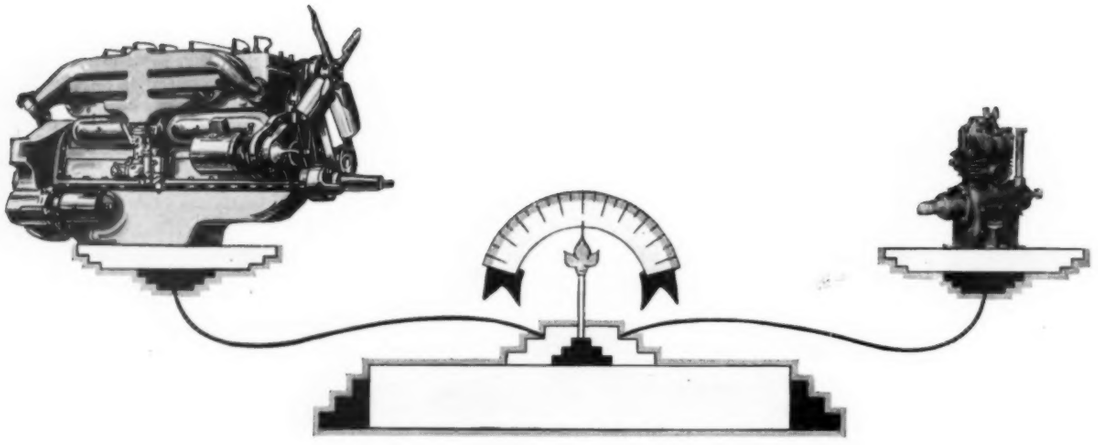

The balance of motor power

More and more the question of adequate control becomes an important factor in the purchase of modern, heavy duty, motor transport vehicles. Day by day, fleet operators in ever increasing numbers are displaying brake consciousness to a marked degree.

Realizing the growing demand for a sure, quick, powerful stopping force . . . the necessity for a perfect balance of modern motor power, the more prominent manufacturers of commercial vehicles are featuring Bendix-Westinghouse Automotive Air Brakes as standard equipment. Such wide-spread acceptance of Bendix-Westinghouse control is in itself a tribute to its remarkable effectiveness.

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Railway Age
Motor Transport Section
Devoted to the Co-ordination of Railway and Highway Service

Vol. 88 June 21, 1930 No. 25

Store-Door Collection and Delivery

ONE of the subjects of most lively interest in railroad circles is that of store-door collection and delivery service for l.c.l. freight. In the past the railways, except in a few isolated instances, have considered it desirable to refrain from giving such service. With the increasing use of motor trucks operated by competitors, the railways have lost a substantial amount of l.c.l. freight traffic, and have cast about for some means of improving their service so as to win this traffic back.

It was not long ago that advocates of railway provision of store-door collection and delivery service for l.c.l. freight were few and far between, and they had little success in making their voices heard.

New Services Provided

There is a somewhat different situation now. While some railways have shown little concern at the loss of l.c.l. traffic to competing trucking lines, others have seemed to feel this loss keenly and have set about in a determined way to recover the traffic for their railway lines. Some railways have established inter-city truck routes of their own, becoming truck operators in every sense of the word, and providing store-door collection and delivery service for freight in the same manner as independent trucking companies. As examples of such operations, there is the Wilson Transportation Company, subsidiary of the Chicago, St. Paul, Minneapolis & Omaha, which has a number of lines in South Dakota, and the Southwestern Transportation Company, subsidiary of the St. Louis Southwestern, with extensive truck routes in the southwest. There are, of course, others also.

The California Plan

Other railways have adopted a plan which appears to have originated in California. In March, 1929, the Pacific Electric, subsidiary of the Southern Pacific, organized a subsidiary of its own, the Pacific Electric Motor Transport Company, now the Pacific Motor Transport Company, which was organized for the purpose of providing store-door collection and delivery service for l.c.l. freight. It is operated in such a way as to co-ordinate railway service and truck service, and motor transport company accepting freight as an ordinary transportation company, handling it from the shipper's door to the nearest Pacific Electric railway station in motor trucks operated by a trucking company working under a contract with the motor transport company, moving the freight by rail to the railway station at destination under a contract of the motor transport company with the parent railway company, and forwarding the freight from the station at destination to the door of the consignee in motor trucks of another contract truck operator. By this means no additional facilities are required, but existing facilities are so co-ordinated and utilized as to provide a substantially improved transportation service.

Similar service is now being offered by the Texas & Pacific through a subsidiary, the Texas & Pacific Motor Transport Company, by the Missouri Pacific through the Missouri Pacific Transportation Company, and by the Missouri-Kansas-Texas through the Missouri, Kansas & Texas Transportation Company, this last operation having been inaugurated within the last few days. Other means of providing store-door collection and delivery service for l.c.l. freight have been provided by other railways.

The point of greatest significance is not the manner in which certain railways are providing their patrons with store-door collection and delivery service, but that they are now providing it at all. This provision of store-door collection and delivery service by steam railways is a radical departure from long-standing practice, and it is natural that there should be keen and widespread interest in it among railway officers.

Traffic Won Back to Railways

Has the provision of store-door collection and delivery service resulted in winning back to the railways traffic which they formerly enjoyed but which they lost when truck transportation came into vogue? An of-

ficer of the Pacific Motor Transport Company is authority for the statement that his company has fully met expectations in getting back a fair share of the l.c.l. freight tonnage that the Pacific Electric had lost to truck carriers. A careful check of the business done by the motor transport company has shown that the traffic handled by it has not been taken from the railway, but that practically every pound of it can be definitely identified as new business that previously moved all the way by motor truck. Furthermore, under this system of operation, the volume of tonnage handled by the motor transport company has required almost no extra help at the railway stations. The service is popular, especially with large shippers, and there has been a great demand for expansion of it. Furthermore, the operations of the motor transport company have been uniformly profitable.

Results Uniformly Favorable

The general freight agent of the Texas & Pacific Motor Transport Company, in an article published in the May 24 issue of the Motor Transport Section of the *Railway Age*, reported that the business secured by the motor transport company had not resulted in a decrease in that of the railway company, indicating that the large and growing traffic of the motor transport company had been won from competing truck lines. Furthermore, similarly favorable results from the establishment of store-door collection and delivery service have been reported by other lines which have experimented in this direction.

Perhaps never before in the history of railroad transportation have transportation methods undergone such changes as in the last few years. Methods of providing transportation service for both passengers and freight, which were long considered satisfactory by the railways and their patrons alike, have been subjected to radical changes. These changes, as is well known, have come about as the result of the advent of motor transportation. One of the most striking cases has involved the method of handling l.c.l. freight.

Subject Merits Close Study

With the example before them of railways which have experimented successfully with the provision of store-door collection and delivery service, railways all over the country are in a position to study these operations and to apply their findings to their own individual situations. Some of them may feel that, notwithstanding the good results obtained by companies which have established store-door collection and delivery service, they should not so extend their own transportation facilities. Others may be expected to find in the experience of the railways which have adopted this means of recovering lost l.c.l. freight traffic, the solution of their own problems. At any rate, store-door collection and delivery is a subject which challenges the close study of railway officers. It is to be hoped that it will be discussed thoroughly and open-mindedly at meetings of the Motor Transport Division, for the division is the clearing-house for information concerning the coordination of railway and highway transportation, of which the provision of store-door collection and delivery service in connection with railway operation is such an excellent example.

Trends in the Sizes of Motor Coaches

THOSE who have followed even casually the development and evolution of modern motor coaches know that each succeeding year has seen changes of a drastic nature in the design and construction of the equipment of the previous year. Just now the most significant changes being made in new motor coaches have to do with their seating capacity. Several motor coaches produced in recent months give rise to the question, how many passengers will be accommodated in the motor coach of the future?

It was not long ago that the largest available motor coaches suitable for inter-city operation had seats for no more than 29 passengers. Today motor coaches seating from 33 to 35 passengers are considered to be of little more than medium size, while equipment affording comfortable seating accommodations for 40 or 50 passengers is to be had.

How long will the seating capacity of motor coaches continue to increase? The limiting factors, of course, are largely the restrictions applied down by state laws. While these limitations as to size and weight in certain instances may be considered unnecessarily restrictive, they are in general necessary because of highway conditions.

The ingenuity of the motor coach designers, however, has opened the way to the construction of motor coaches which are within the bounds of statutory size limitations, and yet allow for the transportation of relatively large numbers of passengers without overcrowding.

So far as the railways are concerned, there appears to be need for at least three sizes of motor coaches. For motor coaches to be operated supplementary to train service between large centers of population and where there is a large daily volume of traffic, motor coaches of the largest size—33 passengers or more—would seem to be advisable. For operation between smaller cities and in territory where the volume of traffic is not so great as to justify the largest equipment on frequent schedules, motor coaches accommodating from 20 to 25 passengers would appear to meet the requirements. For operations parallel to branch lines, where the motor coach service is in complete substitution for passenger train service and where a certain amount of mail, bag-

gage and express and even light freight must be handled in addition to passengers, combination equipment with seats for a dozen or more passengers, and a large cargo compartment might be most satisfactory.

A leading authority on motor coach operation has predicted that before long the principal cities of the country will be connected by motor coaches seating 50 or more passengers and carrying them at a rate of fare of 1 cent a mile. This is an interesting forecast which voices one opinion as to the size of the largest motor coach of the future. Some further interesting developments in the sizes of motor coaches are anticipated, but however large they may become, it appears likely that there will always be a place, particularly in connection with railway operation, for motor coaches of the smaller sizes, and particularly for those motor coaches which are designed to handle both passengers and cargo.

Another Motor Transport Investigation by I. C. C.

AS reported in the Motor Transport Section of May 24, the Interstate Commerce Commission, which made a comprehensive study of motor transportation in the United States two years ago, is setting out upon another investigation into highway operations, both freight and passenger, conducted by common carriers under the jurisdiction of the commission. As announced in the order of the commission which made all common carriers subject to the Interstate Commerce Act respondents in the proceedings, the investigation will be "for the purpose of making such recommendations to Congress respecting such legislation as may be necessary or desirable in the public interest, to accomplish further or more efficient co-ordination of motor transportation."

The commission's investigation two years ago centered particularly around the competitive aspects of motor transportation in relation to other forms of transportation. The present investigation, seems to be concerned more largely with the co-ordination of motor transport with other forms of transportation. In the commission's order much emphasis is laid upon the investigation of the highway operations of the railways, whether they are carried on by means of subsidiary, affiliated or largely independent companies. The investigation will include inquiry into "the arrangements under which such motor transportation is performed by or in competition with respondents, and the legality and propriety thereof; the corporate organization and financial and business relationship existing between respondents and corporations or the stockholders thereof engaged in motor transportation of passengers or property by or in connection or in competition with respondents; the extent to which the property of respondents or the time of employees thereof is devoted to motor vehicle operation to supplement, replace or curtail the rail, water, or rail and water operations of respondents, or as feeders or distributing agencies thereof; the rates, fares and charges, whether local, proportional or joint, the schedules thereof, and the manner of filing and publishing the same; the extent and effect of motor vehicle competition upon the traffic and revenues of respondents; the manner in which accounts of revenues and expenses of such motor vehicle operations are kept; whether the revenues from such motor vehicle operations are compensatory for the cost thereof; and such other matters as may be relevant to a full and complete investigation into the co-ordination of motor transportation."

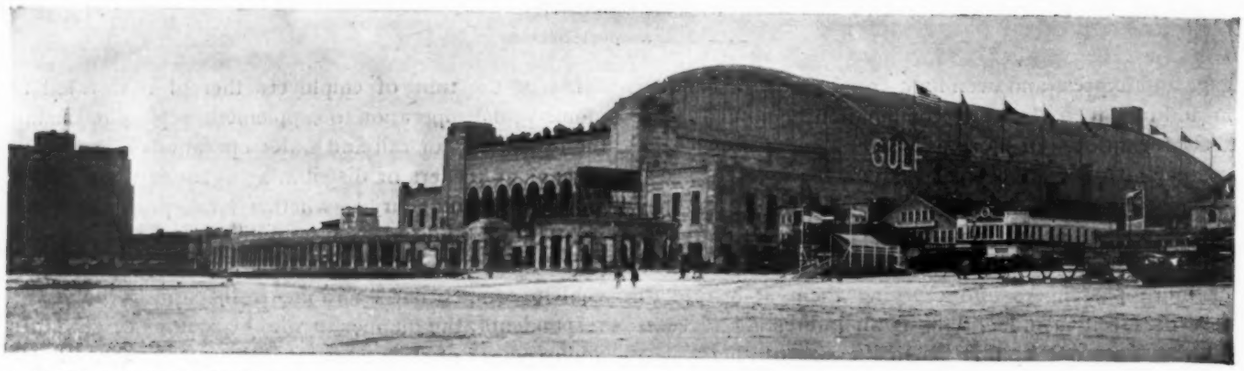
A large number of railways are attempting in one way or another to bring about, in connection with their own operations, some degree of co-ordination of railway and highway transportation. The commission's investigation will probably reveal a wide variety of methods of procedure. The desirability of co-ordinated transport is generally admitted, and it is to be hoped that the commission's investigation will have the effect of extending still further such co-ordination as has already been effected.

Stabilizing Truck Rates

ALTHOUGH motor truck transportation for freight has taken a strong hold in recent years, the rate situation is still chaotic. Railways competing for l.c.l. freight business moving over relatively short distances, and in some cases long distances, have been faced with "cut-throat" competition in its most aggravated form. Truck lines all too frequently quote any rate which will get the business and worry later about whether or not they make any profit out of it.

Progress is now being made, however, in some localities, in stabilizing the rates charged by common-carrier truck lines. In California, for example, there has been developed a uniform freight classification for truck lines containing approximately 11,000 commodity items. Approximately 85 carrier truck lines in California are authorized to use this classification. Among the companies which have adopted the classification is the Pacific Motor Transport Company, subsidiary of the Pacific Electric and the Southern Pacific. It has proved effective in the stabilization of trucking rates on a basis which will protect the interests of operators and shippers alike.

The motor truck has its place in the transportation system. There is work which it can do better than other kinds of carriers. Until the existing unsettled rate situation is corrected, however, there is little hope for the establishment of truck transportation on a sound basis.



The Auditorium at Atlantic City

Program of Motor Transport Division Meeting

General Committee, Law Committee and Rail Motor Car Section take up first day, Motor Coach Section second, and Motor Truck Section third

FOLLOWING is the program of the Atlantic City meeting of the Motor Transport Division, American Railway Association. Sessions will be held at the new auditorium.

First Day

Wednesday, June 18, 1930, Morning Session
(9:30 a.m., Daylight Saving Time)
(A. P. Russell, Chairman, Motor Transport Division, presiding)
Report of General Committee, A. P. Russell, chairman.
Report of Law Committee, R. N. Van Doren, chairman.
Afternoon Session
(2:00 p.m., Daylight Saving Time)
Address by R. H. Aishton, President, American Railway Association

Rail Motor Car Section

(E. Wanamaker, Chairman, Rail Motor Car Section, Presiding)
Reports on the following subjects:

1. The probable rail motor car equipment of the future.
2. Organization for maintenance and supervision of rail motor cars.
3. The future needs in rail motor car development.
4. New methods in train heating. (Paper by S. M. Sovocool, Engineer, Peter Smith Heater Company.)
5. Torque Control for internal combustion engines. (Paper by A. H. Candee, Railway Engineer, Westinghouse Electric & Manufacturing Company.)

Second Day

Thursday, June 19, 1930
(9:30 a.m., Daylight Saving Time)

Motor Coach Section

(P. J. Neff, Chairman, Motor Coach Section, presiding)
Reports of Regional Chairmen on the following subjects:

1. Can motor coach service be profitably substituted for branch line passenger train service?
2. What is the trend and extent of long haul motor coach transportation as compared with long haul rail transportation?
3. What is approximate total cost per motor coach mile of operating short and long haul runs?
4. What steps should be taken to regain passenger traffic?
5. Sale of inter-line motor coach transportation.

A. P. Russell

Third Day

Friday, June 20, 1930
(9:30 a.m., Daylight Saving Time)

Motor Truck Section

(R. K. Stackhouse, Chairman, Motor Truck Section, presiding)

1. Utilization of Motor Trucks in the transportation of freight. (Report of Chairman Stackhouse.)
2. Reports of regional chairmen on the following subjects:
   (a) Trucking rates and tonnage moving by trucks between important points within the following radii: 50 miles such as Baltimore-Washington, D. C., District, 100 miles such as New York-Philadelphia District, 150 miles such as Duluth-St. Paul-Minneapolis District, 250 miles such as St. Paul-Fargo District, 500 miles such as San Francisco-Los Angeles District;

with recommendation as to action necessary to take to meet the situation.

(b) Existing arrangements of trucking concerns in connection with pick-up and delivery service. Extent and effect of such arrangements at the present time on various railroads.

(c) Information as to the nature, extent and effect of truck competition on the traffic and revenue of the carriers. Action taken by carriers to meet this situation and result therefrom.

3. Motor vehicle legislation and taxation. (Address by Pierre Schon, sales engineer, General Motors Truck Co.)

Closing Business

Adjournment

The officers of the Division and the members of the General Committee and the Motor Coach, Motor Truck and Rail Motor Car committees are shown below.

Officers

A. P. Russell, Chairman, Boston, Mass.

P. J. Neff, Vice Chairman, St. Louis, Mo. (Chairman, Motor Coach Section)

R. K. Stackhouse, Vice Chairman, Philadelphia, Pa. (Chairman, Motor Truck Section)

P. J. Neff

R. K. Stackhouse

E. Wanamaker

G. M. Campbell

E. Wanamaker, Vice Chairman, Chicago, Ill. (Chairman, Rail Motor Car Section)

G. M. Campbell, Secretary, New York City.

General Committee

A. P. Russell (Chairman), Executive Vice President, New York, New Haven & Hartford, Boston, Mass.

P. J. Neff (Vice Chairman), Assistant to President, Missouri Pacific, St. Louis, Mo.

R. K. Stackhouse (Vice Chairman), General Superintendent Stations & Transfers, Pennsylvania, Philadelphia, Pa.

E. Wanamaker (Vice Chairman), Electrical Engineer, Chicago, Rock Island & Pacific, Chicago, Ill.

R. L. Fairbairn, Manager Passenger Service Bureau, Canadian National, Montreal, Canada.

H. F. Fritch, Passenger Traffic Manager, Boston & Maine, Boston, Mass.

C. H. Harding, Assistant to President, Southern Pacific, San Francisco, Cal.

A. Hatton, General Superintendent of Transportation, Canadian Pacific, Montreal, Canada.

F. C. Jerome, General Freight Agent, New York Central, New York, N. Y.

C. S. Lake, Assistant to Senior Vice President, Chesapeake & Ohio, Richmond, Va.

G. W. Lupton, Assistant to Vice President, Atchison, Topeka & Santa Fe, Chicago, Ill.

R. N. Van Doren, Vice President and General Counsel, Chicago & North Western, Chicago, Ill.

Motor Coach Committee

P. J. Neff (Chairman), assistant to president, Missouri Pacific, St. Louis, Mo.

C. B. Foster, passenger traffic manager, Canadian Pacific, Montreal, Que.

E. D. Osterhout, passenger traffic manager, Reading, Philadelphia, Pa.

M. F. Steinberger, manager highway transportation, Baltimore & Ohio, Baltimore, Md.

G. L. Whipple, general superintendent transportation, Union Pacific, Omaha, Neb.

E. S. Moore (Chairman, Regional Committee No. 1), general superintendent transportation, Norfolk & Western, Roanoke, Va.

J. V. Lanigan (Chairman, Regional Committee No. 2), passenger traffic manager, Illinois Central, Chicago.

E. W. Lollis (Chairman, Regional Committee No. 3), general superinendent, southern district, Chicago, Milwaukee, St. Paul & Pacific, Chicago.

R. H. Crozier (Chairman, Regional Committee No. 5), general passenger agent, Spokane, Portland & Seattle, Portland, Ore.

R. H. Allison (Chairman, Regional Committee No. 6), assistant to general manager, Cleveland, Cincinnati, Chicago & St. Louis, Cincinnati, Ohio.

R. J. Littlefield (Chairman, Regional Committee No. 7), supervisor of motor service, Pennsylvania, Philadelphia, Pa.

Motor Truck Committee

R. K. Stackhouse (Chairman), general superintendent of stations and transfers, Pennsylvania, Philadelphia, Pa.

C. J. Chenworth (Chairman, Regional Committee No. 1), engineer assistant to vice-president and general manager, Atlantic Coast Line, Wilmington, N. C.

D. W. Russell (Chairman, Regional Committee No. 2), vice-president and general manager, Southwestern Transportation Company, Texarkana, Ark.

B. O. Johnson (Chairman, Regional Committee No. 3), assistant to vice-president, Northern Pacific, St. Paul, Minn.

Paul P. Hastings (Chairman, Regional Committee No. 4), general freight agent, Atchison, Topeka & Santa Fe, San Francisco, Cal.

J. P. O'Brien (Chairman, Regional Committee No. 5), general manager, Oregon-Washington Railroad & Navigation Company, Portland, Ore.

M. F. Steinberger (Chairman, Regional Committee No. 6), manager highway transportation, Baltimore & Ohio, Baltimore, Md.

W. C. Glynn (Chairman, Regional Committee No. 7), assistant to general traffic manager—freight, Pennsylvania, Philadelphia, Pa.

Rail-Motor Car Committee

E. Wanamaker (Chairman), electrical engineer, Chicago, Rock Island & Pacific, Chicago.

L. B. Burns (Chairman, Regional Committee No. 1), assistant to general manager, Seaboard Air Line, Savannah, Ga.

E. W. Lollis (Chairman, Regional Committee No. 3), general superintendent, Southern district, Chicago, Milwaukee, St. Paul & Pacific, Chicago.

G. L. Whipple (Chairman Regional Committee No. 4), general superintendent transportation, Union Pacific, Omaha, Neb.

George McCormick (Chairman, Regional Committee No. 5), general superintendent motive power, Southern Pacific, San Francisco, Cal.

H. M. Eicholtz (Chairman, Regional Committee No. 6), assistant general manager, Chicago & North Western, Chicago.

J. K. McNeillie (Chairman, Regional Committee No. 7), superintendent, Delaware & Hudson, Albany, N. Y.

T. & P. Coaches Improve Service, Reduce Costs

THE substitution of de luxe motor coach service for branch line passenger train service, which formerly connected its main line with a prominent Texas health resort, has been carried out successfully by the Texas & Pacific. The nature of the motor coach service is such as virtually to place the health resort on the main line of the railway, and to provide passengers traveling to and from the resort with what might be termed taxicab service between the main line trains and the hotels located at the resort. Furthermore, the service has not only worked out to the convenience of the patrons of the Texas & Pacific, but it has also effected substantial savings in operating expenses.

Prior to June 7, 1929, passengers traveling to and from Mineral Wells, Tex., changed from the main line Texas & Pacific trains at Weatherford, 22 miles from Mineral Wells, to local passenger trains operated by the Weatherford, Mineral Wells & Western, a short line owned by the Texas & Pacific. The service was necessarily slow and inconvenient, and did not help to attract visitors to the health resort at Mineral Wells.

On June 7, 1929, however, the Texas & Pacific, through the medium of a subsidiary, Texas Pacific Coaches, Inc., began the operation of motor coach service from the train-side at Millsap, Tex., to Mineral Wells. Millsap is on the main line of the Texas & Pacific west of Weatherford, and is only 8.6 miles from the resort town. Two White motor coaches and a Reo truck were placed in service to handle passengers and baggage, connections at Millsap being made with all arriving and departing through trains. The motor coaches leave Millsap at 6:00 a. m., 11:10 a. m., 12:10 p. m., 3:30 p. m., 5:25 p. m., and 10:55 p. m., the running time to Mineral Wells being 20 min. In the other direction, motor coaches leave Mineral Wells at 5:25 a. m., 10:35 a. m., 11:40 a. m., 3:00 p. m., 4:55 p. m., and 10:25 p. m. In Mineral Wells, the motor coaches stop at the principal hotels, as well as at the railroad station, while at Millsap the only stop is made at the new train and motor coach station which has recently been completed.

All one-way and round-trip tickets sold to or from Mineral Wells are honored via Millsap in connection with the Texas Pacific coaches. Baggage checked to and from Mineral Wells is also handled via Millsap in connection with the trucks operated by the highway subsidiary. Texas & Pacific ticket agents sell local book tickets to Mineral Wells as though it were a main line Texas & Pacific station. Conductors on trains stopping at Millsap lift the T. & P. coupons and furnish passengers with checks which are presented to the motor coach attendant for passage from Millsap to Mineral Wells. The ticket agent at Mineral Wells issues Texas & Pacific railway tickets and attaches a coupon covering the motor coach passage to the train-side at Millsap.

The New Texas & Pacific Station at Millsap, Where Motor Coaches and Trucks Meet All Trains

As a result of the establishment of its motor coach and truck service, the Texas & Pacific has been enabled to reduce the passenger train service between Weatherford and Mineral Wells. On the basis of the low cost of the highway service and the saving in operating expenses from the reduction in train service, it is estimated that the Texas & Pacific is saving approximately $600 per month, as a result of the substitution, in addition to furnishing its patrons improved service.

MOTOR TRUCK ANALYSIS.—General Motors Truck Company, Pontiac, Mich., has recently completed a survey of motor truck operation covering the operating, maintenance and depreciation costs of 40,017 vehicles operated by 5,584 business concerns. The report is divided into sections covering various specialized industries and enables an individual truck operator to make direct comparisons between his own truck costs and methods of operation with such figures and methods of others in the same special vocation. One of the divisions deals with contract haulers. The report is a part of the General Motors research and study in connection with commercial transportation.

One of the Fastest Growing Motor Coach Systems Is that of the Missouri Pacific

Within Four Years

Tremendous increase in motor transport activities of railways since inception of Motor Transport division

IN June, 1926, the Motor Transport division had its inception at an informal meeting in Atlantic City, N. J., where a number of railway officers interested directly or indirectly in motor vehicle operation in connection with railway service laid the ground work for the organization of the Railroad Motor Transport Conference, the predecessor organization of the Motor Transport division. In June, 1926, all the railways were feeling the effect of the competition of motor vehicles for passengers and freight, but comparatively few of them were adapting motor vehicles to their own use. In response to the feeling that there was need for an organization of railway officers to study the development of motor transport and ways of co-ordinating it with railway transport, the Railroad Motor Transport Conference, and later the Motor Transport division, were formed.

In the four years which have elapsed since that time, motor transport has become in fact, as well as in theory, a recognized part of railway transportation. Many more railways are operating motor vehicles in 1930 than were operating them in 1926, while the scope of such operations has so increased that the motor vehicle operations of some of the railways are transcontinental rather than local in character. Where in 1926 the motor coaches operated by steam railways were numbered in the dozens, they are now numbered in the thousands and the same applies to a considerable extent to the number of motor trucks, tractors and trailers, operated by the railways.

Operations by Railways

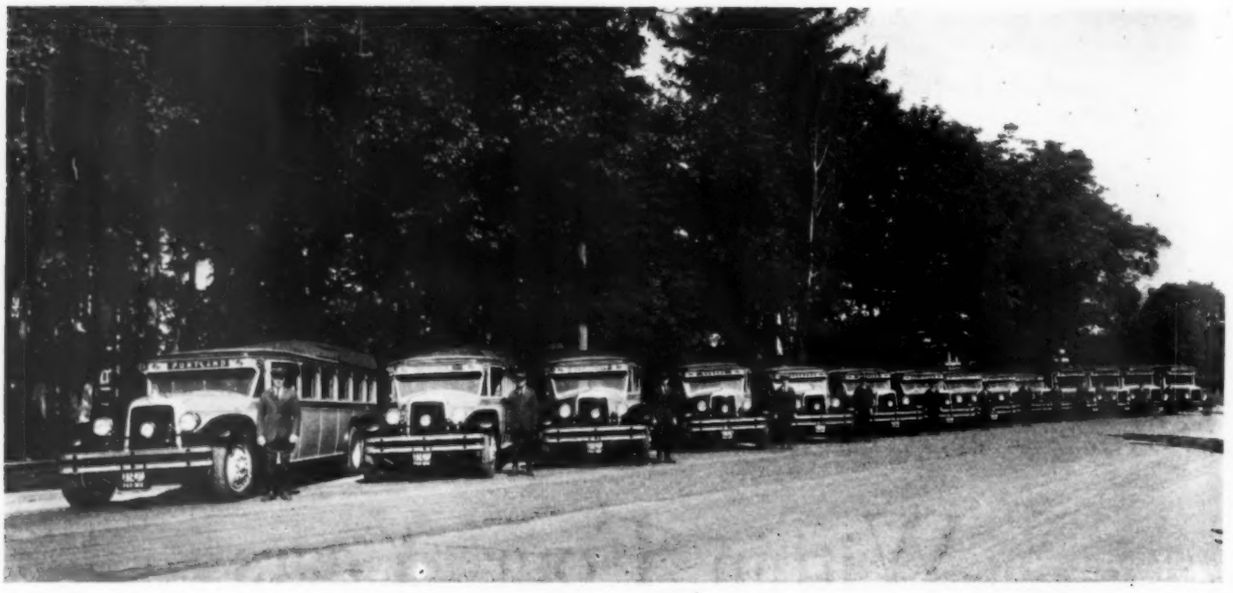
It is estimated that 45 Class I railways are now operating motor coaches, either directly, through subsidiary companies, or through operating companies in which they hold a substantial if not a definitely controlling interest. It is estimated that the number of motor coaches operated by the steam railways through these media is now approximately 3,500, while the mileage of motor coach routes is in excess of 45,000. The number of Class I railways operating motor trucks, tractors and trailers for the transportation of freight is now estimated at 42, while the number of trucks, tractors and trailers operated is in the neighborhood of 6,300. These trucks serve approximately 600 terminals and cover a motor truck route mileage of 7,500, indicating the local or terminal character of most of the truck operations of the railways.

Developments in Four Years

What specifically has been done by leading Class I railways during the last four years in the direction of co-ordination of motor transport with railway transport? Briefly, the developments of these four years have been as follows:

The Atchison, Topeka & Santa Fe, through the medium of a Fred Harvey subsidiary, the Santa Fe Transportation Company, has a unique motor vehicle service in the Southwest which has made readily and comfortably available the scenic regions of New Mexico and Arizona. Up to this year these operations have centered largely around Santa Fe, N. M., and the Grand Canyon in Arizona, but this summer additional "detour" motor coach and motor car routes have been established. In addition, the Santa Fe Transportation Company is operating several common carrier motor coach routes in New Mexico, and by means of motor coach and motor truck operation has completely replaced local passenger train service between Santa Fe, N. M. and Lamy.

The Baltimore & Ohio, through a subsidiary, the West Virginia Transportation Company, is operating a number of motor coach routes adjacent to its railway lines in West Virginia and the surrounding territory. Handicapped at first by difficulty in securing operating certificates, this company by the acquisition of motor coach lines already established is rapidly expanding its highway service. It is also operating train connection



A Line-Up of Southern Pacific Motor Coaches

motor coach service between Jersey City, N. J. and a number of off-track passenger stations in New York and Brooklyn, which has proved popular.

Boston & Maine Expands Operations

The Boston & Maine, one of the pioneers in motor coach operation, has continued to expand its motor coach services so that they now blanket the territory covered by its railway lines. In addition to these scheduled, every-day motor coach services, the Boston & Maine Transportation Company, operating subsidiary of the railway has been successful in operating motor coach tours, to points of special interest in Boston & Maine territory. The company is also operating motor trucks for the handling of l.c.l. freight for the railway.

The Central of Georgia, through a subsidiary, the Central of Georgia Motor Transport Company, has been successful in replacing unprofitable train service with motor coach and motor truck service. It is steadily expanding its operations as earlier replacement of railway service has proved successful.

New York-Harrisburg, Pa., Coach of the Reading and Jersey Central

The Central of New Jersey, operates motor coaches and motor trucks through a subsidiary, the Jersey Central Transportation Company. Substantial savings in operating expenses have been effected by the replacement of train service with motor vehicle service. Recently, this company, in conjunction with the Reading, has engaged in the operation of motor coaches over a line of substantial length, namely, between New York and Harrisburg, Pa. In conjunction with the Reading, it has also established a motor coach service between New York and Philadelphia, Pa.

North Western Joins in Long Distance Operation

The Chicago & North Western has begun the operation of motor coaches through a subsidiary, the Interstate Transit Lines, between Chicago and Omaha, Neb., paralleling its railway lines. This service is part of the long distance motor coach routes operated between the Middle West and the Pacific Coast by the North Western and the Union Pacific.

The Chicago, Burlington & Quincy is still fairly new in the field of motor vehicle operation but within a few months has established a sizeable system of motor coach routes in Illinois, Missouri, Iowa and Nebraska. With an operating subsidiary, the Burlington Transportation Company, it is steadily expanding its motor coach services. Motor coaches are used to supplement as well as to replace certain passenger train services. The Burlington owns 10 per cent of the capital stock of the Pickwick Greyhound Lines.

The Denver & Rio Grande Western, on the basis of direct profit from motor vehicle operation, as well as savings in railway operating expenses through the replacement of train service, is considered to be one of the most successful operators of motor vehicles in the country. One route covers the heavily traveled highway between Denver, Colo., and Colorado Springs and Pueblo. Other lines operated by subsidiaries, the Rio Grande Motor Way, parallel various branch lines in

Southern Colorado and Utah. Both motor coach and motor truck service are provided over these routes.

Huge System Developed in Short Time

One of the fastest growing motor coach systems in the United States is that of the Missouri Pacific. Through the Missouri Pacific Transportation Company, it is operating in the neighborhood of 5,000 miles of motor coach routes, which supplement train service largely but replace certain trains between various points. Recently the company has established joint rail and highway services and has begun to engage also in motor truck operation.

The Great Northern, another pioneer in motor coach operation, has sold its motor coach operating subsidiary, the Northland Transportation Company, to a new company, the Northland Greyhound Lines, the railway taking a one-third interest in the new company. Its operations have expanded steadily, and it now has over 4,000 miles of motor coach routes.

The New York, New Haven & Hartford for years has been a leader in motor coach operation. The operations of the subsidiary, the New England Transportation Company, have been studied by railway officers all over the country, and its methods have been copied widely. Recently it has established extensive motor truck services also. Total passenger revenues of the New England Transportation Company were nearly $3,000,000 in 1929.

Pennsylvania Buys Greyhound

During the past year, the Pennsylvania has become a leading factor in the field of railway motor transport through its acquisition of a substantial interest in the Greyhound Lines, a part of the largest motor coach system in the country, and through the acquisition of a majority interest in several motor coach operations in the vicinity of New York, Philadelphia, and Washington. The companies through which it is operating motor coaches are the Pennsylvania General Transit Company, a subsidiary, the Greyhound Lines and the People's Rapid Transit Company. Motor trucks, tractors and trailers are also widely used by the Pennsylvania to replace and to supplement various kinds of freight train service and to facilitate the interchange of l.c.l. freight in many of its terminals.

In Extent the U. P. Operations Are the Largest Conducted Directly by a Railway

The New York Central continues to be the outstanding railway user of motor trucks. Through contracts with a large number of trucking organizations, it has co-ordinated motor truck service with railway service over its entire system.

The Reading has been consistently successful in its motor coach operations. Its subsidiary, the Reading

P. R. T. Motor Coaches at Pennsylvania Station, New York

Transportation Company, showed a net profit from its operations for the year 1929 and in addition made possible considerable savings in operating expenses of the railway as a result of replacement of unprofitable train service. Motor coach routes of the Reading Transportation Company cover a substantial part of the territory served by the Reading railway lines. Recently it has engaged also in motor truck operations.

Cotton Belt Replaces Train Service

The St. Louis Southwestern has developed a large and distinctive motor vehicle service throughout its territory. Through a subsidiary, the Southwestern Transportation Company, it is operating motor coaches for passengers and motor trucks, tractors and trailers for l.c.l. freight. To an increasing extent these motor vehicles are replacing local passenger and freight train service on the Cotton Belt system, and the operations are steadily expanding.

The Southern Pacific, after establishing an extensive system of motor coach lines of its own, joined with other motor coach operators in the western territory in the organization of the Pacific Greyhound Lines, which comprises the principal motor coach lines operating in Southern Pacific territory. The Southern Pacific has a one-third interest in this company. It has also acquired a one-third interest in the Southland Greyhound Lines, which has extensive motor coach operations in the state of Texas. Recently the Southern Pacific and its subsidiary, the Pacific Electric, have organized the Pacific Motor Transport Company, through which storedoor collection and delivery of l.c.l freight is provided to shippers in various parts of their territories.

The Spokane, Portland & Seattle, the first railway in the country to operate motor coaches, has continued its operations with good results. The principal motor coach route of this company between Portland, Ore., and Astoria has been supplemented by several feeder routes.

Texas & Pacific Tries Store Door Delivery

The Texas & Pacific has organized a subsidiary, the Texas & Pacific Motor Transport Company, to provide its patrons with store door collection and delivery of l.c.l. freight. This company's operations are now carried on over a substantial part of the railway system of the Texas & Pacific and are constantly being expanded. The service has proved very successful. The company also has a train-connection motor coach service between its main line and the resort city of Mineral Wells, Tex.

The Union Pacific, through two subsidiaries, the Interstate Transit Lines and the Union Pacific Stages, Inc., has in a few months established motor coach routes between Chicago and St. Louis in the east, and Southern California and the Pacific Northwest. In extent, its motor coach operations are the largest of any operated directly by a railway. In the establishment of its long distance routes, it has followed the same practice as the Missouri Pacific and many other railway motor coach operating companies in absorbing large numbers of independent motor coach operating companies in its territory.

Other railways, including the Chicago & Alton, the Chicago, Milwaukee, St. Paul & Pacific, the Chicago, Rock Island & Pacific, the Colorado & Southern, the Georgia, the Illinois Central, the Maine Central, the Nashville, Chattanooga & St. Louis, the Norfolk Southern, the Richmond, Fredericksburg & Potomac, the Rutland, and the Seaboard Air Line, have likewise established or expanded motor coach or motor truck operations during the past four years. Nor has the number of railways engaging in motor vehicle operation reached its limit, for within the past two months the Chicago, Indianapolis & Louisville and the Wabash have organized subsidiaries to undertake their first motor coach operations.

D. & R. G. W. Reports Favorable Results

What has been the effect on the welfare of the railways of their use of motor vehicles? According to J. S. Pyeatt, president of the Denver & Rio Grande Western, describing the experience of his company in motor vehicle operation, "there has been some benefit in certain territories resulting from the discontinuance of scheduled trains which were being operated at a loss. The popular demand appears to be for faster and more frequent motor service which can be provided at a lower direct cost. None of the motor service in which we are interested has directly increased the railroad revenues, but rather has brought about a decrease in rail revenues, although as stated above in some instances more economical railroad operation is possible through the elimination of unremunerative steam service in territories which can be adequately served by motor transportation." No changes in railway operating methods have been made possible by the Denver & Rio Grande Western's use of motor vehicles, although in a measure the supplemental motor service has made possible a decrease in the number of local stops made by passenger trains, permitting them to make faster schedules in through service. Mr. Pyeatt states that the majority of his company's patrons are favorable to the co-ordinated railway and highway service.

The Boston & Maine likewise reports favorable results from its operation of motor coaches and motor trucks. In a statement to the *Railway Age*, E. S. French, president of the Boston & Maine, says, "The Boston & Maine has now had five years of experience in utilizing highway service co-ordinated with its rail service. These activities are carried on by the Boston & Maine Transportation Company, and include both motor coach and truck service. Last year, 2,138,000 motor coach miles were operated and 412,800 tons of freight were moved in trucks. Highway service trucks are operated in place of or in addition to rail service where it saves the railroad operating expense, provides a better service and protects against competition.

"There have been benefits, principally from reduced operating expenses of the railroad; because it has been possible to reduce passenger rail mileage and the expense of handling local freight and ferry cars.

"We feel that the public looks upon the use of highway service by the railroads as an evidence of our being alert and ready to meet new conditions with new tools. There has been a reluctance to lose rail passenger service even with motor coach service substituted, but there is a growing recognition that it is inevitable and the only means of continuing organized transportation service to some communities. The substitution of truck service has been accepted without question and with recognition of the improvement in service.

"We believe that, with the continued growth of the use of the private automobile, more branch line passenger services will have to be converted to motor coach operation, and that the motor coach will be used to a still greater extent to relieve through passenger trains of local stops. The trucks will be used more extensively in place of the local freight trains and to concentrate goods at central rail shipping points. Such activities are to the advantage of both the public and the railroads."

Describing the activities of the Southern Pacific with respect to the co-ordination of railway and highway service, Paul Shoup, president, says: "The Southern Pacific is now one of the major railroads most heavily interested in motor transport. Our interest is: (a) Ownership of one-third of the common stock of the Pacific Greyhound Corporation, a holding company for most of the important motor coach lines in California, Oregon, Nevada, Arizona and New Mexico; (b) ownership of one-third of the common stock of the Southland Greyhound Lines, operating important motor coach lines in Texas; (c) operation by the Pacific Electric, a wholly-owned Southern Pacific subsidiary, of a large number of motor coaches in the territory served by the Pacific Electric; (d) ownership by the Southern Pacific subsidiary, the Pacific Electric, of two-thirds of the capital stock of the Motor Transit Company, the largest interurban motor vehicle operator in South California; (e) ownership of a small interest (about one per cent of the common stock) in the Greyhound Corporation, a motor coach holding company whose subsidiaries operate in the east and the middle west. So far as motor truck operations are concerned, we have made some experiment with store door pick-up and delivery through the Pacific Motor Transport Company.

Reduced Operating Expenses

"We have been able to cut down the rail operating expense of passenger trains. It has been possible to discontinue unprofitable branch line trains. Co-ordinated rail and highway service has been accepted by our patrons as a natural evolution in transportation service. We expect to continue the development of feeder motor coach lines and to continue our experiments in store-door pick-up and delivery."

J. E. Gorman, president of the Chicago, Rock Island & Pacific, discusses the nature and results of the Rock Island's motor transport activities as follows:

"We have an arrangement with an outside motor coach company at Des Moines, Iowa, for handling passengers between Des Moines and Winterset, and Indianola. We also have an arrangement with the Willett Transfer Company, under which they handle all l.c.l. business for us between our Taylor Street, Chicago, freight house and our freight station at Blue Island, Ill., and at intermediate stations, Englewood, Morgan Park, Washington Heights and Gresham.

"There have been beneficial results obtained by the more prompt handling of the l.c.l. business in the Chicago district and the operation of the highway trucks by the Willett Company. The present general depression has resulted in a considerable decrease in this business, but we believe that the business is being handled more cheaply than it would be if handled in cars, as was done before this arrangement was made. The arrangement for handling passengers by the motor coach company between Des Moines, Winterset and Indianola, resulted in the elimination of the cost of operating passenger trains which were formerly operated in that territory.

"By the operation of the motor trucks in the Chicago territory, we were able to eliminate several trap cars which were formerly used in this service. When the arrangement was made with the motor coach company to handle passengers between Des Moines, Winterset and Indianola, we were able to eliminate the passenger trains which were running in that territory, and to establish mixed train service with a considerable saving.

"We feel that we have gained considerable favor with the public in the establishment of both the motor truck service in the Chicago district and the motor coach service in the Des Moines district. The question of future developments in the way of co-ordination of railway and highway service is being given consideration at the present time."

No Limit to Benefits of Co-ordination

Substantial savings have been effected by the St. Louis Southwestern as a result of its co-ordination of highway and railway service.

"The St. Louis Southwestern railway lines," says Daniel Upthegrove, president of the Cotton Belt, "have utilized motor coaches and motor trucks indirectly by the organization of a separate Delaware corporation, called the Southwestern Transportation Company, whose operations have grown from a small beginning in 1928, until they are now running 193,887 motor coach miles and 100,789 truck miles, with 30,006 trailer miles, per month. The result of this is that 3,380 freight train miles and 45,942 passenger train miles per month have been eliminated on the railway.

"There has been, of course, an increase in the cost to the transportation company. We have not been able to determine the extent, if any, to which the operations of our own transportation company have affected the decrease in passenger revenue. Apparently, the business was being lost to other agencies as rapidly before as after the organization of our transportation company. The private automobile is a growing factor in the transportation of persons on highways. The railway company has been able to effect savings of $45,186 per month in its operating expenses.

"The reaction of the public toward co-ordinated railway and highway service and toward the highway service alone has been uniformly favorable. The extent to which railway service and truck service will be co-ordinated in the future is difficult to anticipate, as there is no apparent limit to the mutual benefit to be obtained thereby."

Similarly favorable results in the co-ordination of railway and highway service are reported by the Baltimore & Ohio. C. W. Galloway, vice-president in charge of operation and maintenance, says: "The Baltimore & Ohio is utilizing motor coaches in the extension of its service from Jersey City, N. J., to stations it has established in New York City, and is also using motor coaches through the operation of the West Virginia Transportation Company in the state of West Virginia. It is using motor trucks in replacement of local freight trains, where such action is justified; in the transfer of freight in terminals from main to sub-stations, and between the stations of the Baltimore & Ohio and other railroads, and for the handling of company material at various places where such action is justified.

"There have been resultant benefits, either through increased revenues or through reduced railway operating expenses. It has been possible, through the use of motor vehicles, to expedite the movement of freight between stations in terminals, reducing trap-car service. We have also been enabled to eliminate local freight trains in some instances, thus reducing delays and interference to other trains. The same results have been effected in some cases by the use of motor coaches, whereby passenger trains have been eliminated.

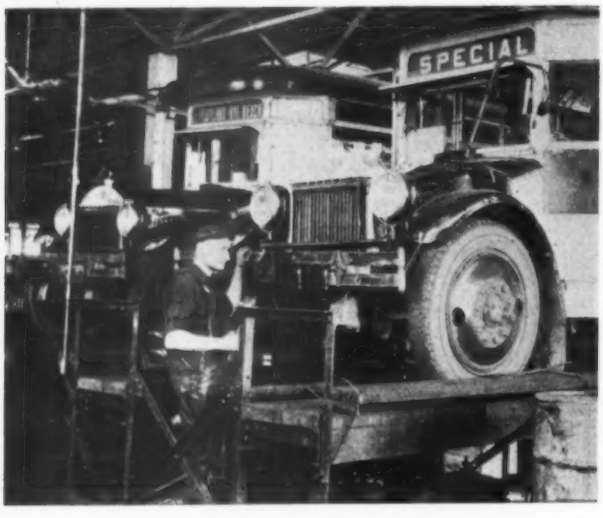
"The reaction of our patrons toward co-ordinated railway and motor coach service, particularly with respect to the co-ordination in New York, has been favorable. It is our opinion that there is a definite place in the transportation field for the motor coach and motor truck, and that there will be continued co-ordination of highway and railway service based upon the needs and requirements of the public, and consistent with the necessary justification for the establishment of such service."

Part of the County Transportation Company's Fleet

Preventive Maintenance Methods Reduce Road Calls

Frequent inspections with repairs made simultaneously result in few mechanical breakdowns

NEED for a better co-ordination of service between the electric train service of the New York, Westchester & Boston, and the local transportation facilities in that section of Westchester County (N. Y.) located between New Rochelle and Port Chester, and that section of Fairfield County, (Conn.,) located between East Port Chester and Stamford, resulted, in the year 1927, in the passing of the trolley systems of the New York & Stamford Railway Company, and the Port Chester Street Railway Company, which for many years had served this section. The need for this better co-ordination of service was accentuated by plans of the Westchester & Boston to extend its main line from Mamaroneck to Port Chester, and also by the rapid growth in population.



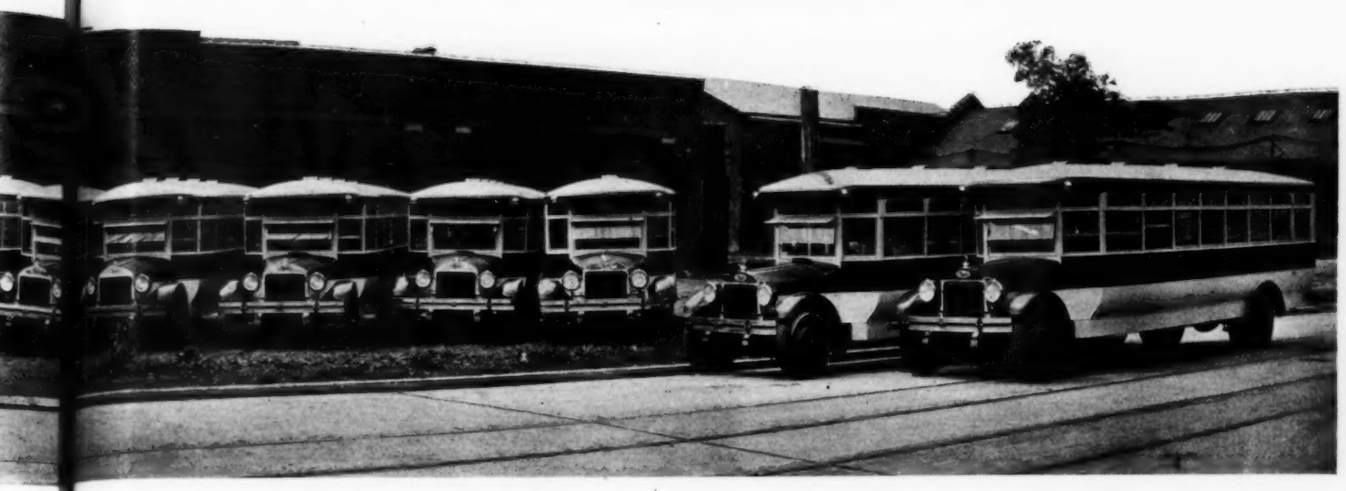
Making Repairs on the Inspection Racks

To adequately handle the thousands of persons dependent upon the transportation facilities of the Westchester & Boston, and to provide for the many thousands more who would be attracted to Westchester as a place of residence with the advent of improved rail transportation, it was necessary to substitute motor coaches for trolleys; it was also necessary to provide a more flexible method of transportation than that provided by the trolley cars. There was another important reason for the substitution of the motor coaches for trolleys. The rapidly increasing costs to the trolley company for its proportion, as fixed by law, of the maintenance and renewal of the paving of the highways along which it operated, was becoming a serious burden.

Hence the birth of the County Transportation Company, Inc., a subsidiary of the Westchester & Boston Railway, which with its parent company, the railway, is today, within four years, supplying transportation to many more thousands of persons who have been attracted to Westchester, and who are coming more and more to rely upon the motor coaches as a means of intra-county transportation in place of the private automobile.

Coaches Co-ordinate with Train Service

The motor coach service of the County Transportation Company, consists of a main line running between Stamford, Conn., and New Rochelle, N. Y., with connecting local routes in Port Chester, Rye, Harrison and Larchmont. The main line runs parallel to the Westchester & Boston between New Rochelle and Port



Chester, while the local lines, in the municipalities mentioned above, connect with both the trains of the Westchester & Boston and the motor coaches on the main line, the schedules being arranged in co-ordination with the railroad service to New York City. At Port Chester the train service of the Westchester & Boston, operated at ten minute intervals during rush hours, twenty minutes during the day and frequent all night service, is extended to East Port Chester, Greenwich, Cos Cob, Mianus, Riverside and Stamford, by means of this co-ordination of train and coach schedules, this service having become effective with the opening of the eastern main line terminal of the Westchester & Boston at Port Chester, last December. Along the main line of the motor coaches in Westchester County, the railroad service of the New York, New Haven & Hartford is also served.

99.9 Per Cent on Time

In White Plains four motor coach lines serve a section of the city containing more than 52 per cent of the population, and connections with the New York Central at Station Plaza, and the Westchester & Boston at Gedney Way station are maintained. Wherever possible, both in White Plains, and also on the main line, the railroad stations are used as waiting rooms and loading platforms for the motor coach service. The motor coach system covers 73 miles of route, and about 2,500,000 coach miles were covered during 1929 with an "on time" average for the year of 99.9 per cent for 237,347 trips.

The operating equipment consists of 64 Mack, 29 passenger motor coaches, twelve of which have six-cylinder engines. The fact that only one make of coach is used greatly simplifies the maintenance problem and makes it possible to establish an inspection and repair system which will fulfill all the requirements of the vehicle but will eliminate needless duplication of effort. Also, the parts inventory is comparatively small, consisting only of those replacement parts which are needed for making the more frequent repairs. The manufacturer's service station at White Plains is used as a source of supply for parts not carried in the store room.

The garage and repair shop, located at Port Chester, is thoroughly modern and has separate shops for making complete overhauls, battery and electrical repairs, tire repairs and repainting. It has up-to-date tool and service equipment, including three inspection racks, power grease machines, presses, brake relining tools, bench tools, etc. A very complete set of special maintenance tools have been obtained from the manufacturer, which have been designed to reduce, as far as possible, the time consumed in removing and disassembling the various units.

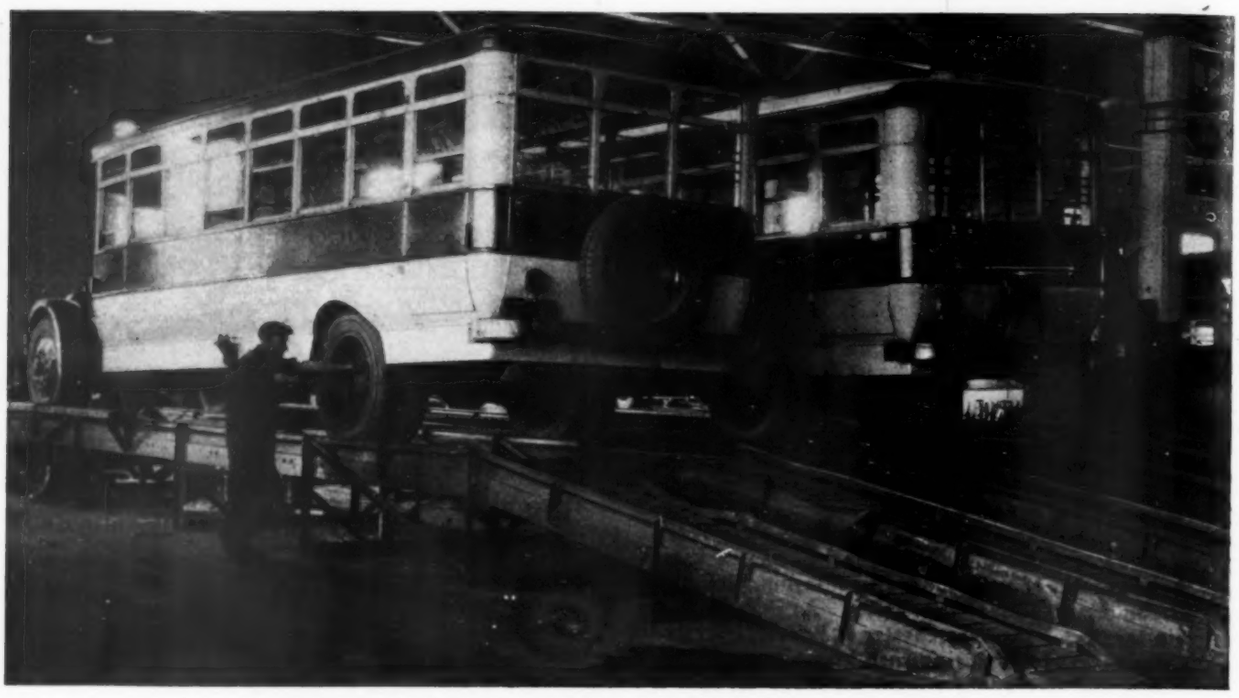
Inspection Methods

The important feature of the maintenance system is that operating defects are detected and corrected before they become serious. The coaches are inspected for the more important defects every night, and they receive a complete inspection every 3,000 miles. An important point of the maintenance procedure is the fact that necessary repairs are completed at the time they are detected, either by the inspector or the garage force, and are not allowed to accumulate until the vehicle is completely overhauled. This plan has been found to result in reduced road failures, fewer complaints by the drivers, and greatly extended periods between the times when complete overhauls are found necessary. Taking the fleet as a whole, 15,000 miles are covered for each mechanical road failure. Eighty per cent of the equipment is over three years old.

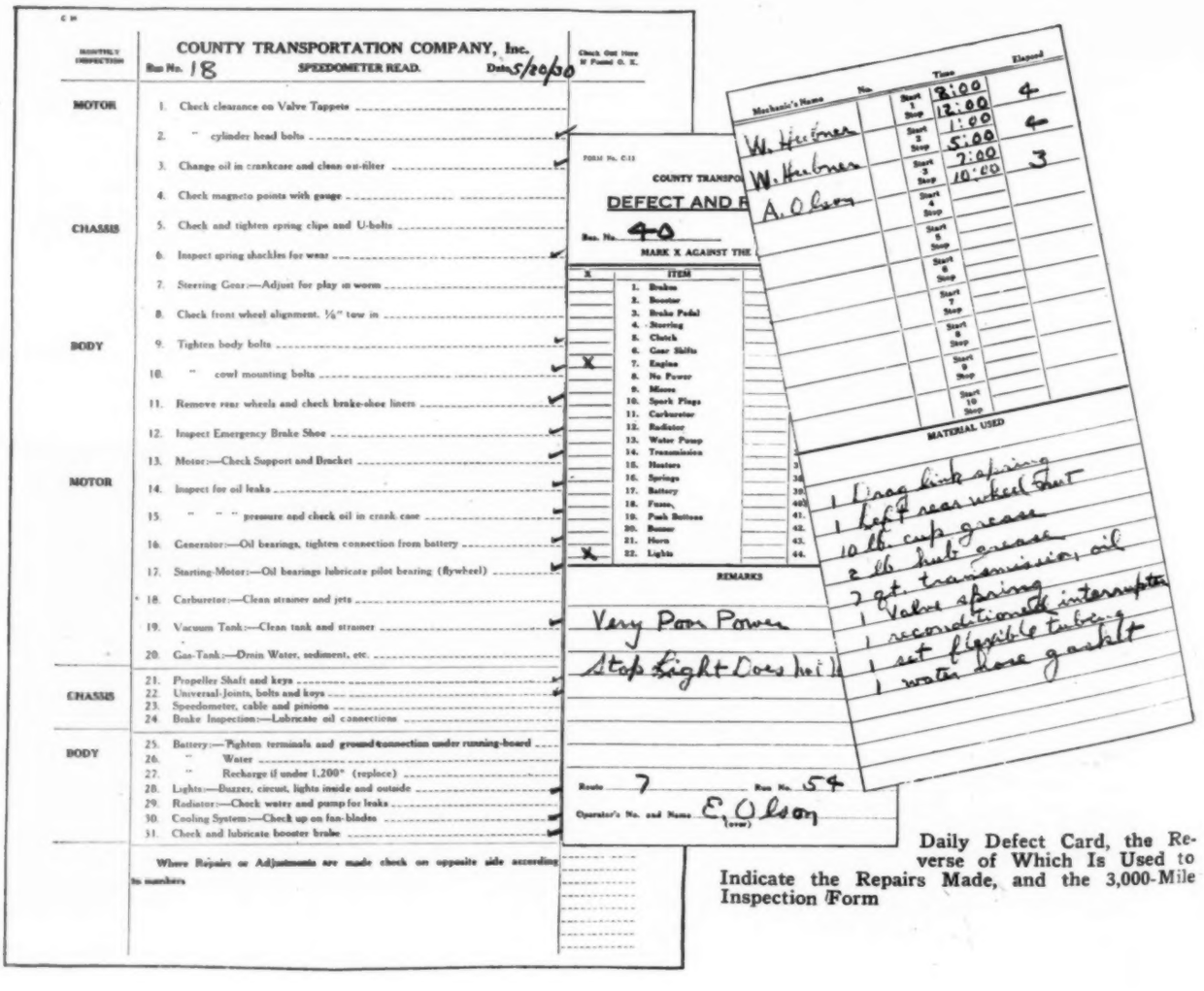
Daily Check

At night the drivers leave their coaches in the yard directly in front of the garage. As they are brought in for fuel, oil and water, the tires are tested for air pres-

Tires are Tested and Inflated by the Night Inspector



Inspection Racks, Located Above Ground, Have Good Light and Ventilation



COUNTY TRANSPORTATION COMPANY, Inc.
Bus No. 18 SPEEDOMETER READ. Date 5/20/30

MOTOR	1. Check clearance on Valve Tappets	✓
	2. " cylinder head bolts	✓
	3. Change oil in crankcase and clean oil-filter	✓
	4. Check magneto points with gauge	
CHASSIS	5. Check and tighten spring clips and U-bolts	
	6. Inspect spring shackles for wear	✓
	7. Steering Gear:—Adjust for play in worm	
	8. Check front wheel alignment. ⅛" toe in	
BODY	9. Tighten body bolts	✓
	10. " cowl mounting bolts	✓
	11. Remove rear wheels and check brake-shoe liners	✓
	12. Inspect Emergency Brake Shoe	✓
	13. Motor:—Check Support and Bracket	✓
MOTOR	14. Inspect for oil leaks	✓
	15. " " " pressure and check oil in crank case	✓
	16. Generator:—Oil bearings, tighten connection from battery	✓
	17. Starting-Motor:—Oil bearings lubricate pilot bearing (flywheel)	✓
	18. Carburetor:—Clean strainer and jets	
	19. Vacuum Tank:—Clean tank and strainer	✓
	20. Gas-Tank:—Drain Water, sediment, etc.	
CHASSIS	21. Propeller Shaft and keys	✓
	22. Universal-Joints, bolts and keys	✓
	23. Speedometer, cable and pinions	
	24. Brake Inspection:—Lubricate oil connections	
BODY	25. Battery:—Tighten terminals and ground connection under running-board	
	26. " Water	
	27. " Recharge if under 1.200° (replace)	
	28. Lights:—Buzzer, circuit, lights inside and outside	✓
	29. Radiator:—Check water and pump for leaks	
	30. Cooling System:—Check up on fan-blades	✓
	31. Check and lubricate booster brake	✓

Where Repairs or Adjustments are made check on opposite side according to numbers

DEFECT AND R
Bus No. 40
MARK X AGAINST THE

X	ITEM	
	1. Brakes	1
	2. Booster	2
	3. Brake Pedal	3
	4. Steering	4
	5. Clutch	5
	6. Gear Shifts	6
X	7. Engine	7
	8. No Power	8
	9. Misses	9
	10. Spark Plugs	10
	11. Carburetor	11
	12. Radiator	12
	13. Water Pump	13
	14. Transmission	14
	15. Heaters	15
	16. Springs	16
	17. Battery	17
	18. Fuses	18
	19. Push Buttons	19
	20. Buzzer	20
	21. Horn	21
X	22. Lights	22

REMARKS
Very Poor Power
Stop Light Does Not

Route 7 Bus No. 54
Operator's No. and Name E. Olson (over)

Mechanic's Name	No.		Time	Elapsed
W. Hartmer		Start 1 Stop	8:00 12:00	4
W. Hartmer		Start 2 Stop	1:00 5:00	4
A. Olson		Start 3 Stop	7:00 10:00	3
		Start 4 Stop		
		Start 5 Stop		
		Start 6 Stop		
		Start 7 Stop		
		Start 8 Stop		
		Start 9 Stop		
		Start 10 Stop		

MATERIAL USED
1 Drag link spring
1 left rear wheel nut
10 lb. cup grease
2 lb. hub grease
2 qt. transmission oil
1 Valve spring
1 reconditioned interrupter
1 set flexible tubing
1 water hose gasket

Daily Defect Card, the Reverse of Which Is Used to Indicate the Repairs Made, and the 3,000-Mile Inspection Form

sure and inflated if necessary; the generator charging rate is checked, blown out lighting bulbs are replaced, and the battery is filled, if necessary. The coach is then run on the wash stand, which is close to the door, and, after washing, the inspector tests the engine, clutch and brakes while driving to the designated storage section of the garage. Each coach has its own marked stall and all equipment on a given route is stored together. If repairs are found necessary by the inspector, a night shift of mechanics is available to do the work. If the repairs cannot be completed by morning a spare coach is substituted and the day force completes the work.

Defect and Repair Card

Every coach entering the garage must have a defect card properly filled out by the driver, indicating the mechanical condition of the vehicle. The driver checks off the items needing attention, entering under remarks any requirement not covered in the list of 44 items. These repairs are made by the night mechanics who enter their time, together with the material used, on the back of the card. One card thus serves three purposes and gives the complete shop record of the coach for one day. It is a practice of the company to assign each driver the same motor coach every day, unless it is in the shop for repairs, with the result that the drivers are quick to report defects and are as anxious as the management to keep the vehicles in the safest operating condition.

The Complete Inspection

At 3000 miles each coach is taken off its run and given a complete inspection, one or two men checking every item shown on the monthly inspection form and making the necessary adjustments. This is not merely an inspection but requires that certain adjustments be made, such as: check clearance on valve tappets, tighten spring clips and bolts, remove rear wheels to examine brake lining and clean carburetor strainer and jets. If no repairs are necessary, the mechanic checks off the item on the face of the card, but if time is consumed in making adjustments a note is made on the back explaining the work done.

This is later entered on a chart which shows all repairs made on each coach. If the need for a major repair is detected, the coach is removed from the inspection stand and the day mechanics complete the work.

Lubrication

Greasing and oiling exerts an important influence on maintenance, and is carried out on a definite schedule. The engine oil is changed and the entire chassis, except wheel bearings, transmission and differential, is greased every 1000 miles by a night crew. Every 3000 miles, when making the inspection, the chassis is greased completely by the day men, including wheel bearings, transmission and differential. To prevent loss of lubricant in the rear wheels due to excessive heat from the brakes, a special extra heavy grease is used which is made of a heavy cylinder-stock base with enough tallow added to give the right consistency. This lubricant has been found to effectively lubricate the rear wheel bearings for the period between complete inspections.

Crankcase oil is cleaned with an electric type filtrator with satisfactory results, daily.

The result of this system of preventive maintenance is shown by the extended periods between necessary complete overhauls, it being frequently possible to cover 80,000 miles before making engine repairs. At these complete overhaul periods, the other important units are rebuilt if their operation indicates that repairs are needed.

Motor Transport Discussed at Eleventh Railway Congress

THE growing importance of motor transport all over the world, and its effects on railway transport, were discussed at the Eleventh International Railway Congress held in Madrid, Spain, from May 5 to 15. The conclusions of the congress on these matters are abstracted below:

Because of the growing importance of road motor transport, and its competition with railway transport, the common interest of both methods of transport and also of the public interest requires an exact appreciation of their respective values as regards communications as a whole; also of the co-ordination of their services.

To attain this end, it is necessary to modify the present position of road motor transport, which in most countries gives it an advantage over the railway, also to make road transport bear its full share of road expenses; in short, that the public charges shall be equally divided between these two methods of transport.

The system of free competition allowed in some countries, or the purely formal authorization of regular motor services without regard to existing communications and without sufficient guarantee of the civil responsibility of the concessionsholders, is not at all in the interests of the public.

The concession of regular motor services competing against the railway or other communications already in existence, which do not give the public any new advantages, should be prohibited. Before granting authority, or a concession for any regular motor service, the authorities concerned should be obliged to take into account the railways of the district and consult the owners thereof.

The indisputable advantages of motor transport, such as direct door-to-door services, operation by small units running frequently and rapidly, immediate organization of a service with but little capital expenditure, are a valuable adjunct to the railway in many cases—services between stations, tourist services, etc.—and everything points to the advantage of collaboration between it and the railway. To assure as far as possible a close collaboration between motor and the railways for transport as a whole, the railways should have the preference for obtaining the concession of regular motor services and take advantage of it.

The competition of road transport is greatest over short distances and causes the diminution of railway traffic, varying according to the number of the road vehicles and other circumstances. Cases have been stated in which this loss has reached 24 per cent of the passenger receipts of trunk lines, and up to 60 per cent of those of local lines, and 10 per cent of freight on trunk lines.

These figures include the losses due to the competition of irregular enterprises, as well as automobiles and trucks owned by private individuals, which, in certain countries where motor traffic is highly developed, are much greater (four times as much in Germany) than the losses due to the competition of regular motor services.

The costs of passenger transport on regular lines of motor coaches are usually about the same as second class on the railways, but in certain countries they are 60 per cent higher. In certain others they are lower than this. Freight rates for road transport are based on railway operations and are, for short distances, generally lower than the latter, but in certain countries several times greater. The diversity of these charges proves that the road transport competition particularly for passenger traffic, must in some cases be attributed to causes other than economy.

Improvements to Meet Competition

To lessen road motor competition, the following improvements of rail transport have been successfully applied.

(a) Passenger Traffic.

Organization of local services of light and frequent trains

in the form of rail motor cars for lines of light traffic, with provision for numerous stops between stations; organization of direct through trains over branch lines; organization of trains at reduced costs at holiday times; improvement of train connections at junction stations; sleeping cars; upholstered seats in third class coaches; delivery of luggage, etc.

(b) Freight Traffic.

Speeding up of transport by means of direct services and complete loads, in certain cases attached to passenger trains; the reduction of time on the journey and stops at stations; reforms in the consigning of freight, especially of parcels, with the object of facilitating their collection and delivery, and speeding up their conveyance; a more prompt forwarding of freight from transhipment stations; organization of private depots for traders, etc.

Road arrangements for ensuring a complete door to door service have been completed on certain railways in the form of motor truck services organized by the railway company itself, or by means of agreement with private truck lines. The use of containers, which can be loaded either on freight cars or motor trucks is increasing rapidly on some railways and facilitates direct transport for "smalls" traffic.

A great many railway companies are organizing regular motor services as subsidiary undertakings, to act as feeder services, or to run parallel lines to relieve local congestion. Some of these railway companies (Pennsylvania Railroad, the Great French Companies, the Dutch Railway Companies, the Swiss Federal Railways, the Italian State Railways) have entrusted the running of their regular motor services as well as the cartage services, and the investigation of questions connected therewith, to companies that they have organized as independent undertakings on capital provided by the railway. According to the information received, these two types of subsidiary undertakings give promise of excellent results due to the collaboration of road and rail, and it is to be hoped that regular statistics will be established on this and other matters.

Mixed services of transport by rail and regular lines of motor coaches belonging to the railways, or other undertakings, with optional itinerary, have been organized by several railways in the U. S. A. as well as in Euope, and appear to be developing. Numerous reductions of passenger fares and freight rates have been made by many of the railways for certain competitive traffic.

An Interesting Experiment

The unfair position of railways in relation to road transport because of their obligation to adhere strictly to fixed tariffs has compelled several governments, Denmark, Holland, Italy, Roumania, Switzerland, Czecho-Slovakia, to make special agreements between the railways and shippers for transport at reduced rates, for a fixed period, of agreed quantities of goods. This measure has proved successful so long as the rates agreed on correspond with the reasonable cost of transport by motor truck, and give the railways something in addition to the actual cost. It appears desirable to bring this system into general application.

Road transport has taken from the railways the monopoly of cheap and rapid communication which they formerly possessed in the localities they served. The present legal regulation of railways in the different countries takes no account of the profound change in their situation in this respect.

It appears to be necessary to lessen the burden of this legislation, which is one of the principal causes of successful road motor competition, which is often prejudicial to the public interest; also to make rating systems more flexible in order to place railways on the same footing as road motor organizations.

The Railway Congress emphasizes the fact that the rail remains the most economical form of transport having regard to actual cost, between the points it serves, and beyond that it is necessary in the public interest that railways should retain their traffic. Railways have to contend with the following difficulties: (1) They are subjected to legal obligations or regulations of a very onerous character; (2) they are burdened in many countries with financial and fiscal charges higher than those of any other mode of transport. In order to avoid serious consequences, economic and financial, it is necessary to remove these two causes of inequality.

The information furnished by the administrations, and other documents, prove that the competition of road transport, which is very serious on certain systems because of local circumstances, has been lessened on other systems by the improvement and speeding up of rail transport, by the organization of regular lines of automobiles forming auxiliary services, and by mixed services of direct transport as well as by other measures, technical and commercial, of the railway administrations, supported by government regulations.

Projects of legal reform, with the object of regulating the obligations and charges of road motor services as well as the easing of certain obligations of the railways, have been reported by several administrations. These examples make possible the hope that motor transport, duly co-ordinated, will become a powerful ally of railways and assist in completing and developing communications for the general benefit of the community.

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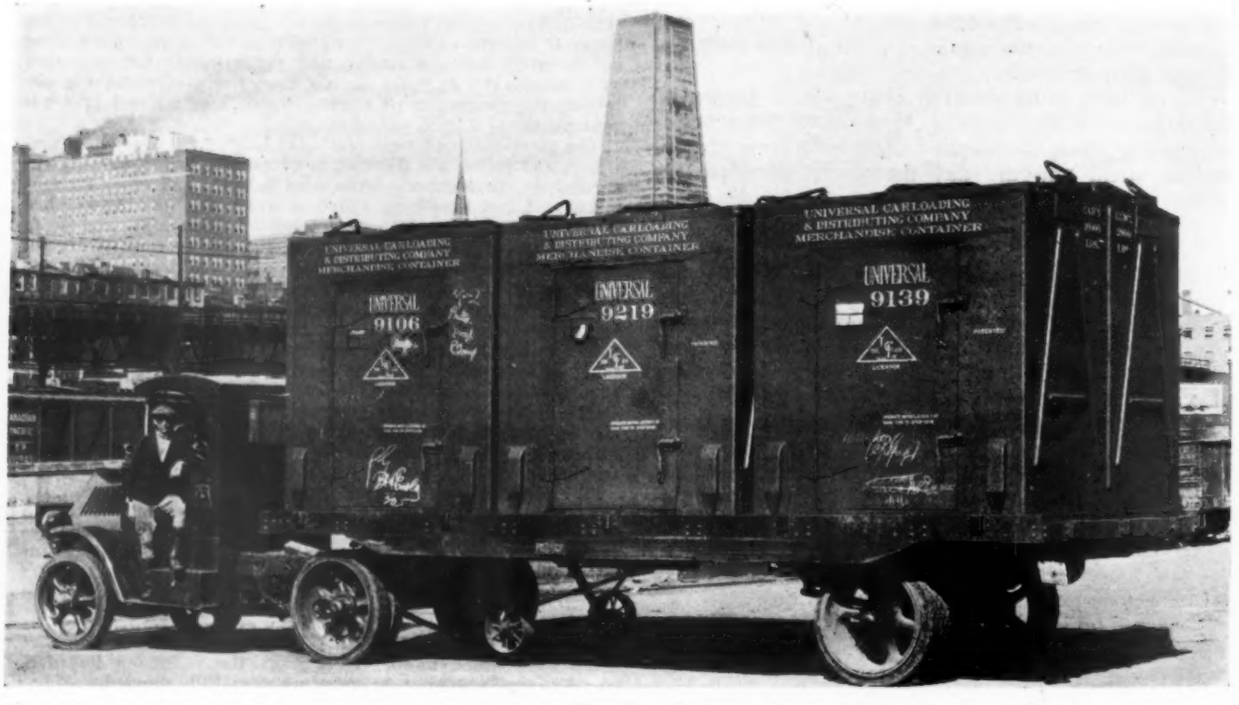
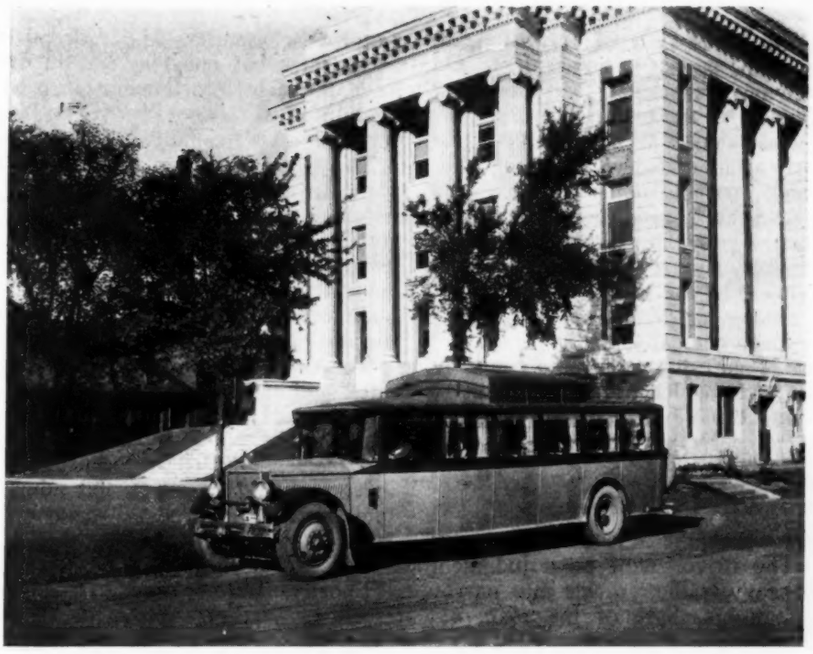

UNIVERSAL CARLOADING & DISTRIBUTING COMPANY MERCHANDISE CONTAINER
UNIVERSAL 9106
UNIVERSAL 9219
UNIVERSAL CARLOADING & DISTRIBUTING COMPANY MERCHANDISE CONTAINER
UNIVERSAL 9139

Heavy-Duty Fruehauf Semi-Trailer, Built Especially for Handling Merchandise Freight Containers, and Mack Power Unit



A Northland Motor Coach

Co-ordinating *Railway and Motor Coach* Claim Work*

By D. H. Kimball
Claims Attorney, Great Northern

WHILE there is much similarity in the handling of personal injury claims arising from motor coach operation with the handling of those arising on the railroad, there are certain elements contained in the former which make a considerable difference psychologically.

The railroad is a huge enterprise, extends over a vast amount of territory, employs thousands of men and, as far as the public is concerned, is rather an impersonal thing. The motor coach operation, however, usually is started in a small way, the owner of the car being the driver. He is the engineer, conductor, brakeman and the company as well. Daily he covers the same route coming in contact with the same people. Thus, he acquires an acquaintance which creates a sympathy for him and his problems. As the business grows, the owner is succeeded by the driver, in the operation of the motor coach, but the same contacts continue. The driver lives in the community, and makes many friends among his passengers and the people along his route, who are willing to assist him in time of trouble.

If the motor coach company is careful in the selection of its drivers, making sure that it is securing careful, courteous men, it has this element which is not often found in the railroad. This makes it easy to secure witnesses, both from the passengers in the coach and from others who are cognizant of the facts. There are, also, more witnesses who actually see the accident; for passengers in the motor coach are likely to be looking ahead, watching the road and seeing what takes place, while passengers on a train usually know nothing about an accident until after it has occurred.

Patrons Are Friendly

The following incident well illustrates the attitude of many of the passengers. We had a motor coach involved in a collision with an automobile. We wrote to the passengers whose names were contained in the driver's report. One of them answered that she was asleep at the time and did not see the accident, but that she was sure that our driver was not to blame.

There is the further distinction between railroad and motor coach operations in that most persons drive automobiles and understand the rights and duties of the

* Paper presented at the convention of the Association of Railway Claim Agents, Richmond, Va., May 21-23.

automobile driver. This leads to a fairer attitude in judging the liabilities of the parties in an accident. On the whole, it has been our experience that the motor coach company receives fairer treatment from the average jury than the railroad does.

Until recently, nearly all motor coach operating companies carried insurance, and did not carry their own risk. As the companies grew in size, more particularly as they became associated with the railroads, there was a greater tendency to carry their own risk, rather than be covered by insurance. In the latter instance, there is a different feeling among the drivers and the operating men of the motor coach company. When they know that the accident cost is paid directly by the company, there is a personal interest which tends to produce a stricter supervision and discipline of the drivers, and this results in much more careful operation and in the elimination of many accidents.

Good Will Created

Much can be said about the selection of careful, courteous drivers. The driver with poor judgment, who speeds through heavy traffic, crowds into narrow spaces, takes more than his share of the road, and splashes through mud puddles at a high rate of speed when passing other users of the highway, is bound to have trouble and accidents. He leaves behind him a trail of antagonized persons who thoroughly enjoy knocking the company and punishing it when given the opportunity to do so. On the other hand, the careful, considerate driver makes his speed when the way is clear, holds well to his own side of the road, and does not fear losing a few minutes to lend a helping hand to some unfortunate who has gone into the ditch. He creates a sense of safety and a good feeling among his passengers, and acquires the good will of the other users of the highway, making friends for his company who are likely to appear on juries in his territory.

There is also a consideration from the traffic department standpoint in a company's carrying its own risk. The insurance companies' only interest in the handling of motor coach operation claims is to dispose of them with as little cost to the insurance companies as possible. It is immaterial to them whether or not they leave dissatisfied, irritated patrons. On the other hand, if the claims are handled by the motor coach company's own representatives, they can be handled quickly and fairly, and prompt adjustments can be made, leaving satisfied patrons who feel they have been treated fairly.

The motor coach company spends a good deal of money each year in advertising for the purpose of attracting business. One dissatisfied, irritated patron can destroy the effect of considerable advertising. A patron who is satisfied and feels that he has been fairly dealt with is an asset to the company.

Where the motor coach company is associated with a railroad, so that its claims can be handled by the railroad claim department, there is a further large economy over that of handling by an outside agency. As a rule, the motor coach company associated with the railway company operates over much the same territory, so that the railroad claim agent, in handling motor coach claims, can handle them in connection with his regular railroad work. A great element of waste in the handling of claim work is in the time lost by the claim agent in traveling to reach persons he must see. When he can look after both motor coach claims and railroad claims arising in the same territory he can greatly reduce the amount of time lost in travel. Frequently, in going to a town, the claim agent can handle both motor coach matters and railroad matters, so that it necessitates but one trip for the two jobs. Furthermore, the motor coach operation, giving frequent service in addition to railway service, enables the claim man to get around very rapidly.

The Great Northern took over a motor coach company, operating about 20,000 miles a day, and absorbed its claim work without increasing its claim department force. The reason we were able to do so was that, by using the various men located throughout the territory covered by the motor coach operation, we could eliminate enough lost motion in travel to compensate for the additional work.

The motor coach drivers, as a class, are wide-awake, intelligent men, and it is possible to secure their co-operation in the work, so as to eliminate many accidents and expedite the handling of the injuries resulting from the accidents which do occur. The discipline of the drivers should be strict and administered with absolute fairness.

Drivers Thoroughly Instructed

Shortly after we took over the motor coach work, meetings were arranged with the drivers. Claim men attended and addressed the meetings, explaining the operation of our work and what reports were needed. Then, through discussion with them—the drivers were urged to ask questions—the reason for each order given, each question asked in their reports, was made clear to the drivers. We found that when they understood them, they were anxious to comply with our requirements.

A system of reports by telephonic advice was installed, similar to the telegraphic reports on the railroad. When an accident occurs, the driver, upon reaching the nearest phone, calls the dispatcher, giving him a brief report of the accident. The dispatcher, in accordance with the line-up prepared, at once calls the claim agent, so that we have a basic knowledge of the facts within a few minutes after the accident occurs. This enables us to get a claim agent on the ground promptly, and frequently the photographer as well, to take photographs before the vehicles have been moved or the conditions in any way changed, and we are able to get the stories of the witnesses while the mental picture is still clear in their minds.

Then, when the driver comes in from his run, he immediately fills out a report blank furnished him for that purpose, giving all the necessary information, and if the accident is of importance, a full statement is taken from him by the claim man. Each driver is furnished with a book of reports, and he is instructed to have each passenger fill out a slip showing his name, residence, destination, if he witnessed the accident, and if he received any injury. These passenger slips are turned over to the claim man upon the driver's completion of his run.

The drivers are instructed to have these slips filled out by the passengers, even in case of accidents which occur in the vicinity of the motor coach, whether the coach is involved or not. The importance of this was demonstrated in a suit brought by the occupant of a car who received very serious injuries in collision with another car. The motor coach was following the car in which the plaintiff was riding. The driver of the car turned to the left to pass a car ahead and collided head-on with a car going in the opposite direction. The motor coach slowed down, passed the cars which had collided, and stopped far enough ahead to permit the

(*Continued on page 1522*)

Truck Lines Move Toward Stability

California operators adopt uniform classification of freight as basis for assessing charges—Growth of traffic tremendous

By Lewis A. Monroe

Transportation rate expert, Los Angeles, Cal.

THE growth in the past few years of motor freight transportation lines operating as common carriers throughout the United States has been tremendous, and owners and operators of such lines have had but little time to devote to details, really essential to the financial success of the business, such as the adoption of a properly constructed uniform system or basis for assessing their freight charges. By reason of its greater flexibility, motor freight transportation usually involves both a store door pick-up and a store door delivery service. Rates, therefore, to be remunerative, must necessarily take into consideration the cost of this additional service which is not performed by the rail lines.

In establishing rates, due consideration must also be given to the value of the merchandise, the manner of packing, liability of damage and the space occupied, on account of the limited loading capacity of motor equipment. Motor freight lines are really operating an expedited freight service in competition with express companies rather than with rail freight lines, and rates to be commensurate with the service performed should be established with this condition in mind.

Truck Lines Regulated

The State of California was among the first to give serious consideration to the regulation of this class of transportation service, and on May 1, 1917, a law became effective giving to the railroad commission of that state full jurisdiction over the rates and service of such motor carriers as were operating between fixed terminals and over regular routes. Shortly thereafter an order was issued by the commission, requiring such carriers to file their tariffs showing the rates that were being assessed. This order resulted in the filing of some 350 freight tariffs applying between various sections of the state. It was found that no two tariffs were alike and all were vague and indefinite.

Almost immediately thereafter, the Railroad Commission of California refused permission for the motor freight lines to adopt the classification used by the rail lines, on the grounds that no motor transportation line could possibly comply with the rules, regulations and conditions of a classification published for the specific use of rail lines. Later, in its Decision No. 17365, the commission said, "The Western Classification is not practical nor acceptable to the commission as a classification governing automobile line tariffs."

Early in 1919, anticipating the development and needs of the motor freight transportation lines, the author established in the city of Los Angeles a rate and tariff bureau, giving attention primarily to the compilation of a motor freight classification which would meet with the approval of the railroad commission and satisfy the particular needs of this rapidly developing method of transportation.

Fourth Edition of Classification Published

The first edition of Monroe's "Ship by Truck" Freight Classification was published in March, 1920, showing about 2,000 commodity items, and was filed with the railroad commission for use by four motor freight lines. The second edition was issued in May, 1923, with approximately 3,000 commodity items and about thirty participating lines. The third edition was issued in November, 1925, containing about 6,000 items, with some sixty or more motor freight lines participating.

The fourth edition, which is the present one, became effective on January 15, 1930, with approximately eighty-five lines authorized to use this uniform method of assessing freight charges, they being about 75 per cent of all the lines in the state that could use such a basis. This fourth edition consists of about 270 pages and is complete and up-to-date, containing about eleven thousand commodity items, describing the various methods of packing, and leaving nothing for guesswork. It covers every conceivable problem that may arise as to the proper rating to be applied, showing many items and packing requirements not now shown in the rail lines' classification.

This fourth edition has been built up through a classification committee of principal motor freight operators with the full co-operation and approval of the traffic managers of the principal shipping and manufacturing firms of Los Angeles, and particularly the Traffic Managers' Conference and the traffic department of the Los Angeles Chamber of Commerce, and it has very generally met with the approval of the shipping public.

In addition to meeting the needs of these participating carriers for their local business to and from Los Angeles, the fact that all lines operating in southern and central California use the same classification has enabled the various motor freight lines operating in every direction out of Los Angeles to establish through routes and joint rates between substantially all points in California south of Fresno and San Luis Obispo, a practice impossible without the use of a uniform classification.

Adopted by Southern Pacific Subsidiary

This classification has also been adopted by the Pacific Motor Transport Company, operating express (rail and truck) service over the entire system of the Pacific

Electric railway in Southern California, and over the Southern Pacific lines between Los Angeles and Santa Barbara and between Los Angeles and Bishop and intermediate points, and in the north between San Francisco and Oakland and the San Francisco Bay territory, which covers a radius of approximately 100 miles from San Francisco.

This motor freight classification is intended primarily to take care of the general merchandise handled in less than truck loads, but is frequently used for truck or truck and trailer loads by publication of two or more lines of class rates. Each carrier party to the classification has its own individual tariff showing the class rates that are governed by the classification, which rates apply between the points served, and in a separate section of this local tariff, the commodity rates which usually cover specific commodities that are handled in straight truck or truck and trailer loads.

The local tariffs of the various motor freight lines that are parties to this classification publish 1st, 2nd, 3rd and 4th class rates between all points served. The classification, aside from these four class ratings, also provides additional ratings based on the 1st class rate, viz:—

1½—1½ times first class	3t1—3 times first class
D1—Double first class	4t1—4 times first class
2½t1—2½ times first class	5t1—5 times first class

Stabilized Trucking Business

The establishment of this system of tariffs by the motor freight lines operating in California has resulted in placing their business on a proper transportation basis of the highest standard and on a parity with the rail lines.

The following figures, taken from the annual report of the Railroad Commission of California, are enlightening, and show the tremendous growth of motor freight transportation service in this state by the lines that operate between fixed terminals and over regular routes:

Fiscal Year—July 1 to June 30, Each Year

Year	Equipment operated Trucks and Trailers	Number of Tons Handled	Revenue Derived
1921-22	1,000	399,593	$1,943,584.49
1922-23	Records not available		
1923-24	Records not available		
1924-25	4,000	1,000,000	6,420,912.11
1925-26	4,500	1,174,814	7,662,826.91
1926-27	4,500	1,231,176	8,903,351.99
1927-28	4,500	1,740,081	8,461,103.65
1928-29	5,000	2,130,106	9,249,698.14

* * *

At the Pennsylvania Motor Coach Terminal in New York

Co-ordinating Claim Work

(*Continued from page 1520*)

passage of traffic. Suit was brought some months later, alleging that the car in which the plaintiff had been riding was following the motor coach and that the coach had suddenly stopped, forcing the driver of the auto to turn out abruptly to prevent colliding with it. Witnesses who first saw the coach after it was stopped supported this testimony, and it was only through the evidence of the coach passengers that the facts were established. Without this rule, it would have been impossible, at the late date that the suit was brought, to have located these passengers, and a substantial judgment would have been secured against the company.

The motor coach company installed a bonus sytem, whereby, if he has no accidents, the driver receives a bonus in addition to his salary. The bonus is sufficient to be attractive to the drivers, and they work hard to earn it. If the driver does have an accident for which he is to blame, the bonus is reduced accordingly. The claim agent's report of the accident is made the basis of consideration as to the driver's fault. At first there was an inclination on the part of the drivers to duck, but after they became convinced that the claim agent was their friend and that they would get a fair report we received their whole-hearted co-operation.

Working in conjunction with the operating department of the motor coach company, stressing the value of the cars, and applying strict discipline with absolute fairness, a corps of drivers has been developed who are careful and courteous. This has resulted in a big reduction in accidents, and in a reputation for careful driving which has been a great asset for the motor coach company. The constant stressing of care cannot be overdone.

All motor coach companies, I think, require their drivers to come to a full stop at all railroad crossings. Following out the idea of stressing extreme care, we not only require the drivers to come to a full stop at railroad crossings, but in addition to open the door before looking and to close it before starting. The idea is to force them to take some positive action, which would have a tendency to get away from the mechanical action of the old, experienced man, who does the same thing so many times under familiar conditions that his action is automatic and is done sub-consciously.

There have been three motor coach accidents, comparatively recently, in which the coach came up, stopped at the railroad crossing, and then proceeded in the face of the on-coming train. It was to get away from this stopping and looking automatically without seeing or sensing, that the opening of the door was required. In the first instance, it was hard to convince the operating men and the drivers that the opening of the door was necessary, since the driver could see perfectly well without so doing. However, they have been converted so that now there is no questioning of the necessity.

The railroad claim department, handling the motor coach company's claim work in conjunction with its own, ought to take care of it much more economically than an insurance company, for the reasons given. Furthermore, the insurance premium not only has to cover the actual amounts paid in the adjustment of losses, but it includes the soliciting agent's commission as well as the profit to the company. However, I am inclined to think that the possibility of creating good will is often the greater asset to the motor coach company than the dollar saving.

Rail-Motor Truck

Co-Ordination in Great Britain

By Alfred W. Arthurton

British Railway Companies Association

SINCE the railways of Great Britain were granted powers to operate on the highways in August, 1928, they have laid the foundations for a complete co-ordination of rail and highway passenger services by acquiring a financial interest in all the larger motor coach companies and in some cases by purchasing these concerns outright. This process is still going on and it is probably only a matter of time before the few remaining motor coach operators of any size will enter into similar arrangements with the railways. The licensing restrictions which are likely to come into force if the pending Road Traffic Bill becomes a law should effectively prevent the establishment of any considerable new undertakings for transporting passengers by highway.

The problem of the road haulage of freight was quite different and has had to be solved in an entirely different way. Not only are there numerous small trucking concerns who cannot be absorbed or negotiated with in the same way as the large motor coach companies, but there are also many large firms which operate their own motor trucks, partly for long distance haulage and partly for local delivery work. Freight traffic competition from independent truck lines, although severe in some districts, is much less formidable than that resulting from the operation of their own fleets by business houses. Hitherto the railways, in view of the fact that they already had extensive trucking services, have moved in the direction of extending their own highway freight operations rather than endeavoring to come to

"The British railways have now become more than carriers and are in a sense retail distributors. They provide their clients with a service which for low cost and added convenience cannot be equalled elsewhere . . . They are facing the problem of rail and highway co-ordination for freight traffic in a practical manner. Their purpose is to develop highway services, both passenger and freight, as an integral part of their transportation system, but whereas on the passenger side they have relied upon co-operation and agreement with the independent motor coach companies, on the freight side they have decided to institute their own services to combat the severe competition from which they were suffering."

any agreements with their independent competitors.

The railways have had to face a re-orientation of policy in regard to freight traffic in order to bring their methods into line with the highway transport powers they now possess. As far as heavy freight is concerned the railway is the form of transport which the highway can hardly challenge. It is in the sphere of the lighter classes of merchandise that the railways have had to make plans to utilize their road powers more effectively. Lost traffic of this kind, it was realized, could be regained only if quicker and cheaper transport could be offered from the premises of the consignor to those of the consignee by rail and highway combined. The problem to be solved was two-fold. The railways had to be able to offer a service more attractive and more economical than that provided by the business houses themselves; the second question was the proper use by railways of motor trucks.

The two parts of the problem are complementary as upon the increase of their fleets of motor vehicles and the efficient use thereof depends in a great measure the railways' success in soliciting firms operating their own trucks or employing truckers to perform long distance transport. To regain this business the railways have had to approach each shipper independently, determine by how wide or narrow a margin they were failing to secure his business, and satisfy him that they could transport his products more cheaply, speedily and conveniently than he could himself.

An L. M. S. Motor Truck

At the time they secured general powers to operate on the highways the railways confined their activities in the main, so far as freight transport was concerned, to the collection and delivery of goods to and from stations, for which purpose they had some 3,400 motor vehicles and more than 30,000 horse-drawn vans, etc. The railways of Great Britain were built in the days of horse transport and stations were therefore rarely placed more than four or five miles apart, as the efficient radius for collection and delivery of freight by horse-drawn vehicles was not more than a few miles. The coming of the motor vehicle has changed that, and the effective radius for the operation of motor collection and delivery services is now at least 20 miles.

Cartage Service Valuable Asset

The cartage service of the railways has been a valuable asset in the steps taken against highway competition. The regular clearance of traffic from freight stations by railway road vehicles, with corresponding collection of forwarded traffic, enables the facilities at stations to be utilized with the utmost economy. The radius of cartage work, so far as station-to-station traffic is concerned, is being extended and the railways are, to an increasing extent, taking the cartage work into their own hands instead of relying on outside agents for this service. Replacement of horse cartage by motor vehicles has also increased the radius of activity and ensured greater speed of operation. This has been carried out particularly in the London area. At the South Lambeth station of the Great Western, for instance, the entire replacement of horse by motor vehicles has been completed. Sets of special demountable gear have also been provided to permit loading and unloading operations while the trucks are on their collection and delivery rounds.

Unremunerative Branch Lines

The problem of unremunerative branch lines is complicated by the fact that where passenger traffic has diminished or practically disappeared there is invariably a fair amount of freight traffic remaining. It is difficult to effect real economies by introducing more economical equipment for passenger service when special steps have to be taken to handle the freight traffic, and the general attitude of the public when the closing of any branch line is proposed is that although they may in most cases travel by highway they are loth to lose rail service altogether. In many cases, however, it is cheaper and quicker to send by highway where carriage by rail service involves transfer at a junction, and in such circumstances the railways themselves are now using motor trucks.

The success of the container system of transport and the rapid development of railhead stations throughout the country within the last 18 months have shown conclusively that the efforts made by the railways to regain or retain traffic have been completely justified. Thousands of containers, which enable merchandise to be transported direct from shipper to consignee without intermediate handling, are in daily use, and with the advantage of speedy conveyance over long distances by rail they provide a service for all classes of freight which cannot be equalled by highway throughout. In fact, it is not too much to say that a firm which has once used containers has never gone back to its previous shipping methods. This combination of rail and highway service has been the means of winning a great deal of traffic back from the motor trucks.

Railhead Distribution

The growth of railhead centers of distribution also has rendered the establishment of retail distributing organizations at factories and plants almost unnecessary. The railhead stations (i.e. warehouses), situated on railway premises at strategic points throughout the country, enable the manufacturer or merchant to place stocks in close proximity to his market, and merchandise can often be delivered to the customer within a few hours after the order has been received. The system is both a time and money-saver as goods can be dispatched to the railhead station in bulk at cheaper rates. Space can be obtained at the station if desired for offices and show rooms and the whole organization can be controlled by the firm's own staff. Alternatively, the railways undertake the whole of the work connected with a railhead station, such as controlling stocks, checking, accepting and executing

orders and delivering the goods to the customer by motor truck.

In some cases special trucks, painted and lettered to show the name of the firm whose commodities are being handled are provided, while in other cases the freight is handled in common with that of other firms. Trucks operate from important railheads and cover the surrounding country, delivering supplies, collecting empties, etc. In other cases railway motor trucks deliver bricks to some new building site in the country or distribute electric cables, pipes for drainage projects, etc.

It will be seen that the British railways have now become more than carriers and are in a sense retail distributors. They provide their clients with a service which for low cost and added convenience cannot be equalled elsewhere. . . . The whole plan is revenue-producing and its development increases each month. One railway has some 700 railhead stations, which range from small sheds to large warehouses, established at their stations between London and Aberdeen.

One of the most important experiments yet made in connection with the transportation of agricultural and other rural freight traffic is being carried out by the railways on an extensive scale, by means of which outlying farms and villages situated some distance from the railway have been brought within the railway orbit. Co-ordination has been effected between the farmer and the railway in the establishment of a remarkable network of new transport services.

The function of the rural trucking service is to collect and deliver within regional limits surrounding a station where such services are usually performed and charged for in the rail rate. It has been found however that when the offer has been made to handle station-to-station traffic also the farmers and local merchants generally were glad to leave the cartage of such traffic to the railway, and thus the railway motor truck gradually became the universal rural hauler it is today. The districts cover a radius of some 15 miles from a station on which the service is based, and to serve outlying villages and hamlets certain days of the week are allocated to fixed itineraries.

The general plan of operation in these services is that freight is moved by fast trains over long distances at low rates from the big manufacturing towns to the nearest distribution center, where it is transferred to railway motor trucks and conveyed direct to destination. In the reverse direction farm or dairy produce is collected by the railway trucks, conveyed to the railhead and transferred to fast freight trains for forwarding to destination. By means of this arrangement the railway is, especially for long journeys, able to afford a cheaper, faster and more reliable service than that provided by the independent trucker.

Container Service on Great Western

Services Valuable to Farmers

The arrangement is of special benefit to the farming community as it not only provides for the conveyance of bulk loads by rail at reduced rates to a given center, but includes a rural trucking service to anywhere within a radius of approximately 15 miles of that center. The farmer is therefore able to have his feeding cake, meal, seeds and fertilizers delivered to his farm, while in the opposite direction he can dispatch his produce direct to all parts of the country. Where he has hitherto had to perform all his own cartage he finds in this new enterprise of the railways a welcome relief from the hazards of the modern highway and is able to reduce expenditures by confining his horses to work on the farm. On the other hand the railway service is improved at stations by a quicker clearance of freight cars than under the old system. An indirect benefit to the railways also is the use of the trucks, when collecting or delivering in country districts, for distributing railway literature regarding reduced fare excursions and other passenger service advertising.

As far as possible, the motor trucks deliver and collect at the door but where this is not feasible agents are appointed in the villages. Wholesale and retail merchants alike are availing themselves of these new facilities, and are finding benefit in the handing over of all their transport work to the railways who, after all, have long and valuable experience in such matters.

The charges for the service are moderate and are well advertised throughout each locality served. Although the majority of the services are in conjunction with freight transport by rail, a considerable local trucking business has been developed between farm and farm and from village to village along the various routes served. The railways appreciate that the activities of independent truck lines now cover practically every type of traffic, and their policy is to encourage farmers and others to rely on the railways for all forms of transportation.

Services Increasing

The Great Western has 130 country trucking services radiating from stations in agricultural areas all over its system, and it is anticipated that in the near future practically the whole of the territory served by this company will be linked up in the same way. The London & North Eastern has similar services in operation at nearly 300 stations south of the Humber, and the rail-highway service of the London, Midland & Scottish is in operation at

Rural Trucking Services Greatly Benefit Farming Communities

nearly 500 stations. On the Southern experimental door-to-door services combining the advantages of rail and highway transport are being developed in Kent, Surrey, Sussex and other counties for the collection and delivery of freight.

The whole movement is fraught with great possibilities for the revival of agriculture and the opening up of country districts remote from railways. The services in many outlying districts are receiving a warm welcome among people who have hitherto had to rely on forms of transport which were both spasmodic in their activities and variable in their charges. Areas such as these have suffered in the past from inaccessibility.

Sugar Beet Traffic

Of special interest are the arrangements made for the movement of the sugar beet crops, a growing industry in Great Britain, to railhead for forwarding or direct to factory by highway. Beet cartage work sometimes involves movement over field tracks and roads which are unsuitable for ordinary motor vehicles. Special fleets of six-wheelers are therefore provided which drive right onto the fields in many cases with a trailer of 4 tons, making an aggregate of 8 tons net weight per journey. These plans aim at closer co-operation between grower, railway and factory. It is hoped to improve the efficiency of sugar beet transport generally and to provide a farm-to-factory service by combining highway and rail transport and offering it at a reasonable cost to the grower.

Another development is the provision by the railways of special motor trucks in which cattle, and particularly sheep, can be quickly hauled to and from the loading pens at the station or to or from the market. The saving of time in transport is here coupled with the advantage of delivering the animals in excellent condition.

Milk Traffic

The influence of these agricultural motor services on the future of unremunerative branch lines and of intermediate stations will be considerable. In view of the effective radius of operation of motor delivery services economies may be possible by centralizing collection and delivery work at large stations and closing down intermediate stations. By a more extensive use of motor trucks and by increasing the radius of collection and delivery areas, it may be possible to effect economies and to offer services more attractive to the trader. A type of service particularly suited to motor transport is the conveyance of milk. On a number of branch lines motor truck services have been inaugurated in place of trains on Sundays, thus providing satisfactory and more economical connections with the main lines.

Freight Services Throughout by Highway

In addition to the country trucking services to and from railway stations a network of new freight services operated entirely by highway motor vehicles are planned to cover large areas of the North and Midlands. The first of these services was inaugurated late in 1928 by the L. M. S. and L. & N. E. between Leeds and Bradford; a second operates between Hinckley and Leicester for the local industries of hosiery and boot and shoe manufacture and the raw materials for those industries. Numerous similar services are contemplated. This new type of freight service constitutes a direct challenge on their own ground to the independent truck lines and involves the transport of goods by the railways direct from producer to consumer without putting the traffic on the rail at all. Prior to their obtaining Parliamentary powers to operate on the highways the railways were prevented from instituting services of this kind but they are now able to meet their competitors on equal terms.

In the latter case two collections and two deliveries are given daily—twice as good a service as was formerly provided by rail—and as the distance between Hinckley and Leicester is only 13 miles it has proved to be very practicable.

Eliminating Transhipments

Until the appearance of highway motor transport on a large scale, although the small freight car was admittedly uneconomical as compared with large, if larger cars were used the number of transfers from car to car was increased and the speed of transit diminished. Between two large stations freight collected one day is invariably delivered on the next, but between two places of minor importance the journey might occupy three days. The consignment was collected by motor truck, sent by rail to the prescribed transhipping point, carried by express service to another such point, sent from there to the destination station in a direct car, and finally delivered by truck.

(*Continued on page 1532*)

Dispatching System Eliminates Lost Motion

Columbia Terminals Company successful in having equipment ready when needed and in moving loads quickly

By James F. Mooney

Chief Dispatcher, Columbia Terminals Company

THE dispatching system of the Columbia Terminals Company at St. Louis, Mo., offers many interesting suggestions to the operator of motor trucks. Briefly, it is based upon approved methods of railway dispatching without impairing the great asset of the motor vehicle—flexibility. By this system, the officials of the company at any time of the day are able to tell at a glance the operating condition in any district, as well as the location of each piece of equipment.

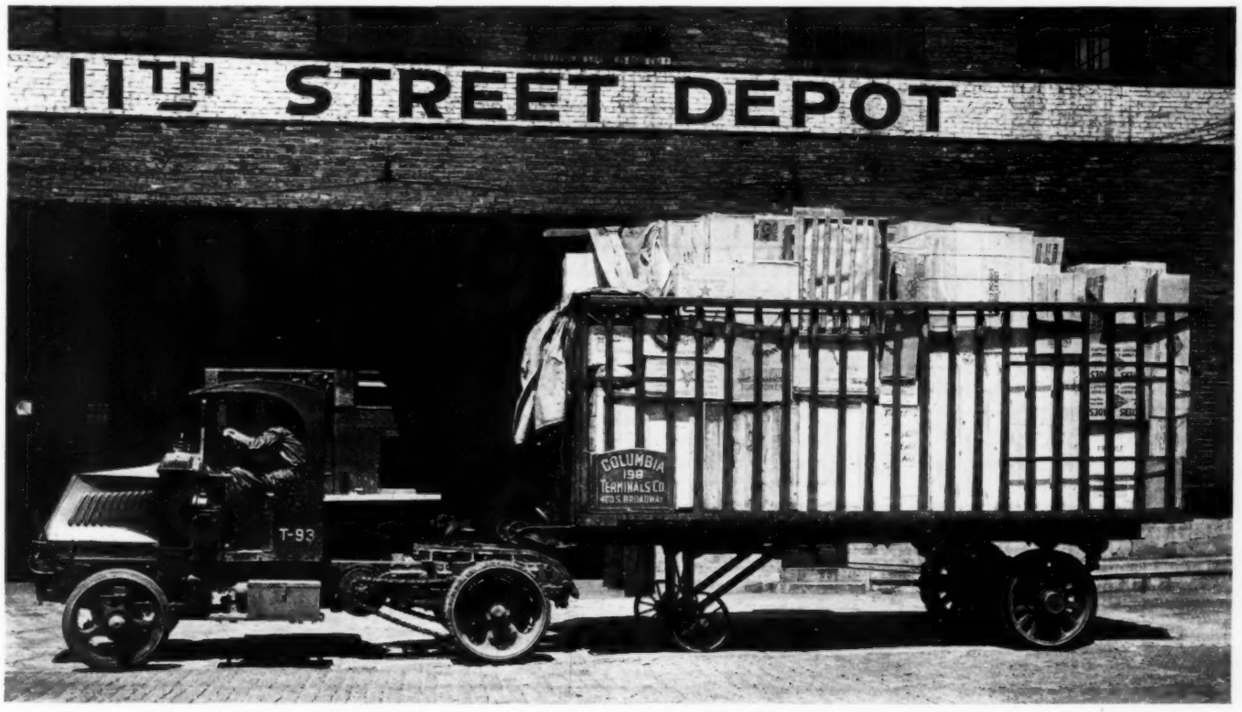
The Columbia Terminals are agents for all lines entering St. Louis, Mo., and East St. Louis, Ill. They handle daily 7,000,000 pounds of merchandise for the account of the railroads. Part of this is interchange traffic between carriers, and the remainder is handled through the company's four inbound and six outbound universal off-track stations.

Because of the physical lay-out, the company has found it necessary to divide its operations into three districts, each of which is in charge of a superintendent. East St. Louis is across the Mississippi river and is the terminus of thirteen eastern trunk lines which have no facilities on the west bank of the river. Ten railroads, an inbound and an outbound depot form the North End district which is located in St. Louis proper. Three railroads, five outbound and three inbound stations, together with a storage warehouse, form the South End district.

Three Men on Dispatching Staff

The dispatching staff consists of three men; one in East St. Louis, one in the North End, and the chief dispatcher in the South End at the company's general offices. These three dispatchers are in constant communication with each other over private wires. They exchange information and ideas, relay reports and maintain a high standard in the systematic moving of freight.

After considerable experimentation, the Columbia Company in 1921 determined upon tractors and semi-trailers as the most suitable motor equipment for their



Type of Tractor and Trailer Equipment Operated by Columbia Terminals Company

uses. At the present time, 107 tractors and 440 trailers are in service. Tractors are housed in two garages, one located in St. Louis, Mo., and the other in East St. Louis. Trailers are allotted to the Columbia depots and the various railroads in accordance with the volume of freight handled. Thus, each of the thirty-seven freight houses served can depend upon its quota of equipment, and this quota is not disturbed except under unusual operating conditions.

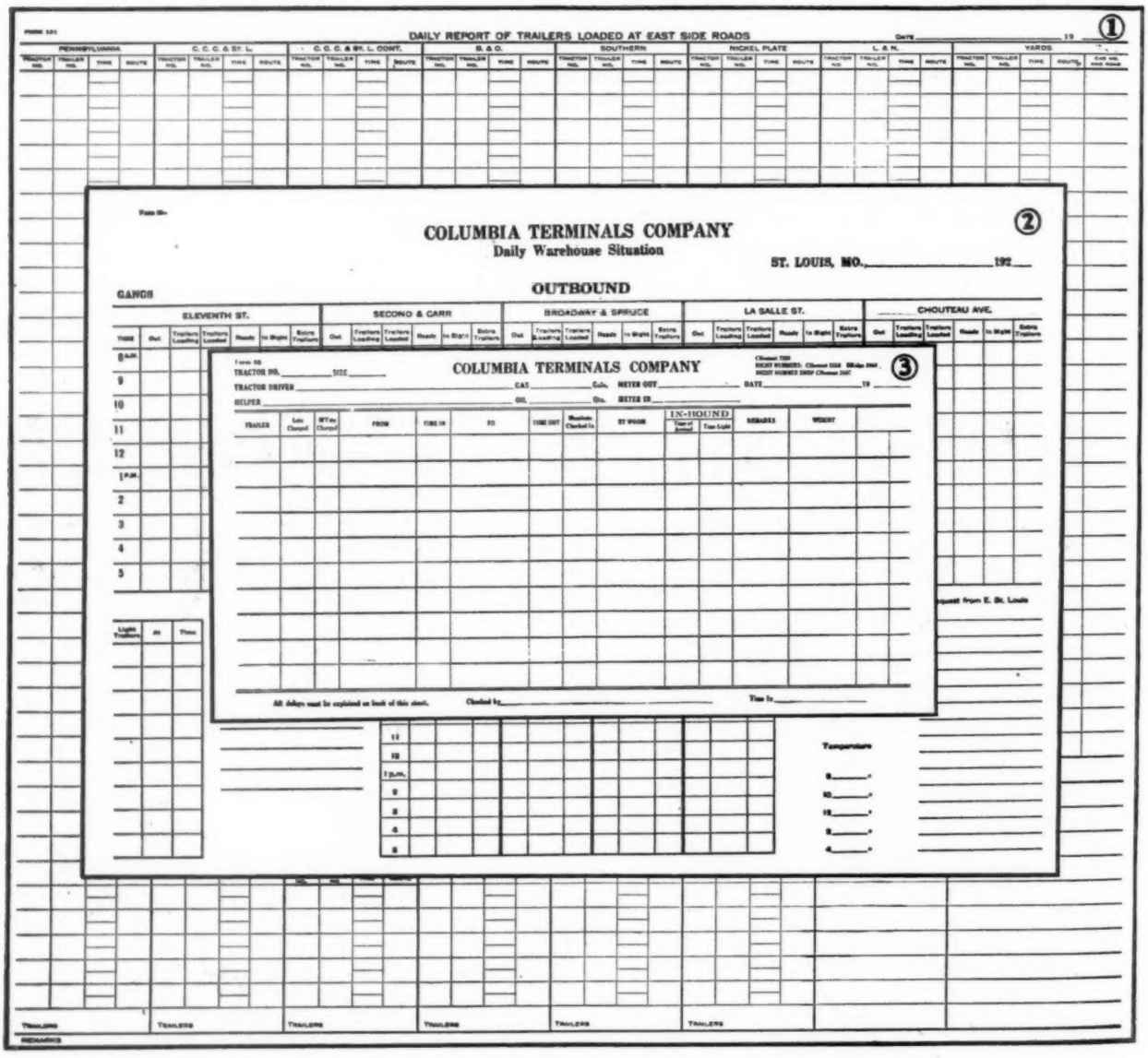
The dispatching system of the Columbia Terminals Company not alone controls the orderly and efficient movement of a great motor fleet, but permits the dispatchers to anticipate in advance the requirements of the various depots.

By means of a regular series of hourly reports, supplemented by additional information when necessary, the dispatchers are always aware not only of the loads ready to move but the approximate time when additional loads will be ready throughout the day. In consequence, when a certain district anticipates more than usual movements, the dispatcher in this district so informs the chief dispatcher, who arranges to run loads where the tractors can be used to advantage when light.

The Beginning of the Day

Shortly before the actual start of the daily operations, the chief dispatcher communicates with each district superintendent to determine the exact number of loads ready to move. With this information, the chief dispatcher advises the garage superintendents to distribute motor units and crews accordingly. This is the beginning of the day's operations. On a form provided for the purpose, garage superintendents show tractor number, name of chauffeur and helper, and destination of first load. This form is immediately forwarded to the office of the chief dispatcher.

In a file on the chief dispatcher's desk is kept a series of cards, white and blue. Each card represents a tractor. Crews operating from the west side garage are identified by a white card, while the crews operating from the east side garage are identified by a blue card. Every move and the time it occurs is recorded as the



1. Daily Report Which Shows Trailers Loaded at Each Railroad Station. 2. Hourly Report Showing Operating Situation at Stations. 3. This Report Shows Daily Movements of Each Tractor

day goes along. Within a few seconds, by merely counting the cards, the dispatcher can determine the exact number of crews in each district and when they can be counted on for another load. This system enables the chief dispatcher to direct and control the fleet during the day. The North End dispatcher and East St. Louis dispatcher do not use the card system, but instead are supplied with a special form upon which they record the movements of the crews into their territories, as relayed to them by the chief dispatcher. Hourly, current operations from the company's outbound and inbound stations are reported to the chief dispatcher. The outbound stations' report shows the number of loads already moved, number of trailers loading, number loaded and ready for delivery, an estimate of loads on the platform, and the empty trailers in the station available for loading. The inbound stations' report shows the number of loads being unloaded and any empty trailers on hand. This information guides the chief dispatcher as to the proper move to protect each station from any congestion.

At 8:00 a.m., transfermen located at the railroad depots call their local dispatcher, reporting the number of merchandise cars on hand at each station; and as each load is completed, they call the dispatcher, giving trailer number and destination. This car report is relayed to the chief dispatcher, and from this report he is able to judge the volume of business expected from these districts during the day.

Disposition of Loads on Schedule Time

Experience in the handling of commodities, and the number of stops the crews must make, has enabled the company to fix a time schedule for disposition of loads. Normally these conditions are met. In unusual cases, when lots of extraordinary number must be checked or when accidents or unavoidable delays arise, an additional allotment of time is granted, according to the circumstances. The chief dispatcher, when he notices a unit late, calls the district dispatcher, transferman or superintendent in order that the proper attention may be given the delayed crew.

The very nature and extent of the operations calls for a speedy system of communication. At each railroad station, the company has installed its own private telephones so that the crews encounter no delay in calling the dispatchers, and so that immediate contact be had with the transfermen when necessary. Contact with the chief dispatcher is so essential that a private telephone system is used. On the chief dispatcher's desk is a "telephone board," having a direct private line to each company outbound station, a direct line to each district dispatcher, and three private lines for the incoming calls. This eliminates lost time.

Trailers Ready When Needed

The quota of trailers at each station is so fixed that, as loads are moved, a replacement is made immediately. In East St. Louis, the dispatcher is guided by the flow of loads reported to him by the transfermen. If sufficient crews are not available to handle the volume, a request is made of the chief dispatcher to provide the necessary equipment to meet the situation. In this case, when insufficient east loads are ready at the west side stations, it becomes necessary to request equipment "over light." When a requisition of this kind is made, an order number is placed with the chief dispatcher, showing the required number of crews and the time request was made. By "over light" is meant that a crew, having disposed of a load at one of the west side depots and having an empty trailer, upon calling the chief or North End dispatcher, instead of being ordered into one of the west stations for duty, is instructed to take the empty trailer to East St. Louis. The crew crosses the bridge and reports to the East St. Louis dispatcher for assignment. At times, five, ten or fifteen crews are sent out within the short period of a few minutes. By this means, any possible congestion is quickly avoided.

That operating crews might produce the maximum volume of tonnage, the company years ago adopted a bonus system which enables both chauffeurs and helpers to earn extra money after they have handled a certain tonnage each day. In addition, the company rewards its chauffeurs for careful driving. These two factors simplify the work of the dispatchers in keeping the tractors moving, and enables the company to man their equipment with careful, industrious workers.

Special Precautions Avoid Delays

When the tonnage is extraordinarily high, in order to utilize the crews and to keep them moving, special precautions are taken to avoid delays. For instance, the transfermen, assisted by several extra clerks, relieve crews of tickets. Instead of the chauffeur and helper waiting for receipts, the transfermen handle this work. This helps greatly in expediting the movements of the crews, and is termed the "quick turnover."

The flexibility of the tractor and trailer permits motor power available for duty as an emergency may arise. In this operation, if the pressure of time for delivery necessitates immediate motor power to move a load, or if unloading conditions at a destination will require an unusual length of time, the dispatcher will instruct the chauffeur to "drop the load." The helper remains to unload the load, while the chauffeur and tractor are assigned to further duty. This eliminates the tying up of any motor unit and enables the dispatchers to meet any emergency.

Anticipates Next Day's Requirements

In order that the management be guided as to the proper number of motor units needed to operate efficiently each day, shortly before the close of a day's operations the outbound depot foremen communicate with the principal shippers who are patrons of their depots, while the district superintendents make a complete survey of the railroad stations, for the purpose of obtaining first hand information relative to the volume of tonnage expected for the next day. At 4:30 p.m., the foremen and superintendents call the chief dispatcher, giving what is termed the "final report." This report shows the complete operations of the depots for the day; in short, the number of loads moved, the condition of platform, the number of loads ready for delivery at the start of the next day, and a prospectus of what business is to be handled the following day. The chief dispatcher prepares this report in summary and submits it to the officials, who determine the amount of equipment which will be necessary to care for the needs adequately.

The policy of the company, "Service to have what you want, where you want it, when you want it," has developed this dispatching system. Waste of time has been eliminated, crews have an incentive—their bonus—to produce the umost, and no time is lost in the utilization of the motor units. In short, the Columbia Terminals Company find that a dispatching system is necessary efficiently to control the movements of a great fleet in the performance of that essential business asset —service.

Maintaining Motor Trucks in Isolated Districts

Railway Express Agency places a traveling mechanic in charge of maintenance in outlying territory

IN an endeavor to improve the present methods of maintaining the large fleet of motor vehicles which it operates in all sections of the country, the Railway Express Agency, about a year ago, decided to put a traveling mechanic in charge of a small fleet of trucks in a specific territory which was located at some distance from the nearest company repair shop. The territory selected was to include towns in which the Express Agency's motor vehicle equipment consisted of from one to three units and, due to its isolated location, was to represent a section where difficulty had been experienced in obtaining adequate maintenance facilities.

The Tool and Parts Boxes are Mounted on Casters

Under the old plan in such territory, the driver lubricated and made minor repairs on his own truck, and at certain predetermined periods, the truck is sent to the division repair shop for partial or complete overhaul. Under the new plan, the traveling mechanic was to devote all of his time to keeping the trucks in condition, and if there was work that he could not perform, either due to emergencies or to lack of proper tool equipment, he was to have it attended to in outside repair shops where proper facilities for doing the work might be obtained at reasonable cost. The object of this experiment was to see if, with constant and careful mechanical attention, doing what was needed when necessary, the equipment could be kept in satisfactory operating condition, up to the time of its retirement, without recourse to a complete overhaul. The theory of the test was that if the vehicles were maintained efficiently and not allowed to deteriorate to the breaking point, there would be no necessity for complete overhaul in the division repair shops of the company.

The plan was first put into effect on Long Island, the territory extending from Huntington to the east end of the island, in which is located a total of 24 vehicles, spread over a distance of 68 miles. The mechanic lives and has his headquarters at Patchogue, which has a central location in so far as his sub-division is concerned, and is the farthest point having frequent train service from New York, the division headquarters. As all of the mechanic's supplies and spare parts are sent from the division headquarters, the matter of train service is important.

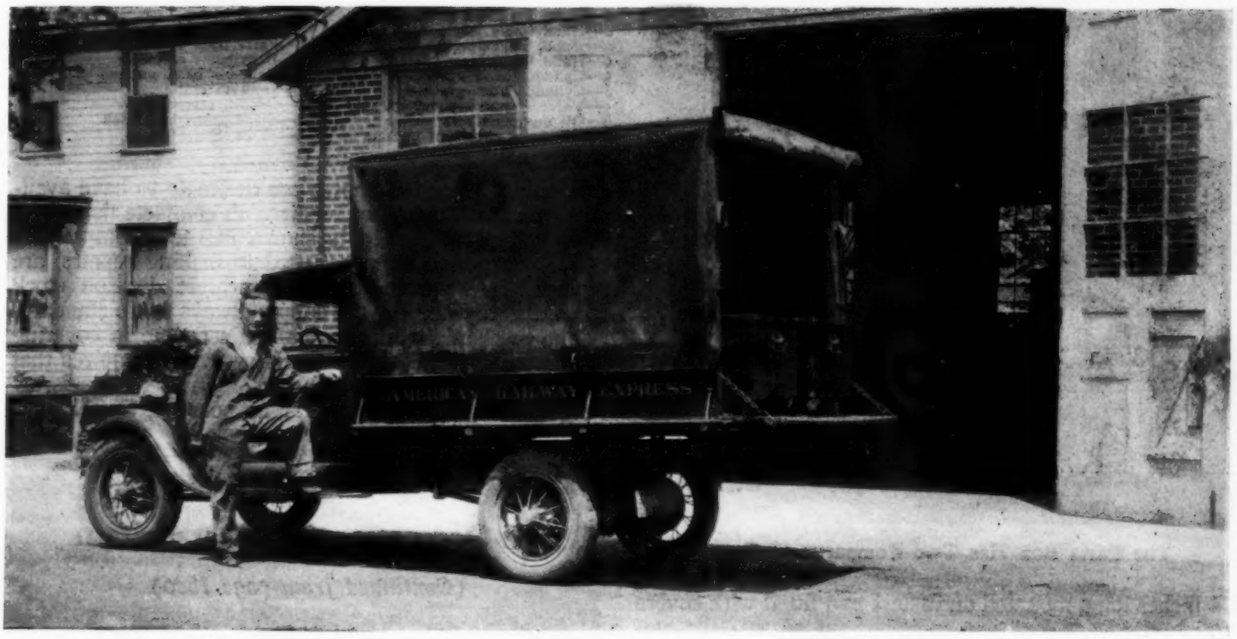
This plan of maintenance has proven so successful on the east end of Long Island that another traveling mechanic will shortly be put on the west end, covering all towns and cities except Brooklyn and Jamaica, and it seems probable that other sections, having similar operating characteristics, may be taken care of in this way.

The sponsors of the plan agree that the integrity and mechanical ability of the mechanic are the most important factors in the success or failure of the scheme. A man lacking in these qualities can easily let the equipment become run down to an extent where complete overhaul or replacement becomes a necessity.

When the service was started, the eastern Long Island mechanic was given a new truck, with standard express body equipment. This truck he turns over to the driver of the vehicle to be repaired. He then inspects and makes the necessary repairs to the local truck as it stands at the station platform, if the weather permits. If not, he takes it to the local storage garage, where the truck is kept overnight, and makes the repairs. When more than a full day's time must be put on a vehicle, the mechanic drives it to Patchogue, his headquarters, and completes

Table 1—Mechanical Tools and Equipment Carried by the Traveling Mechanic

1—Folding work bench	1—25 ft. Portable drop light
2—10 Ton hydraulic jacks	1—Battery hydrometer
1—4 in. Machinist's vise	1—Alcohol hydrometer
1—Portable electric drill, ½ in.	1—Small pinch bar
2—Small adjustable horses	1—Medium pinch bar
1—Tool box	1—Tap wrench
1—Compartment box	1—18 in. Monkey wrench
1—Water pump stuffing box wrench	1—Grease gun for transmission oil
3—¼ in. Straight shank twist drills	1—Wheel aligning rod
3—$\frac{5}{16}$ in. Straight shank twist drills	1—Zerk hand grease gun
3—⅜ in. Straight shank twist drills	1—Dot hand grease gun
1—$\frac{7}{16}$ in. Straight shank twist drill	1—Alemite hand grease gun
1—½ in. Straight shank twist drill	1—Tire pressure gauge, high pressure
1—Set wire gauge drills	
1—Set screw extractors	1—Tire pressure gauge, low pressure
2—⅛ in Pipe taps	
2—¼ in. Pipe taps	1—Qt. green enamel
1—Set speed socket wrenches	1—Qt. red enamel
1—Pair bolt clippers	1—Qt. black enamel
1—Hack saw frame	3—2 in. Flat brushes
1—Electrical soldering tool	2—Cans penetrating oil
1—Pair 12 in. snips	1—Can shellac



The Traveling Mechanic, With Truck and Equipment, at His Headquarters in Patchogue

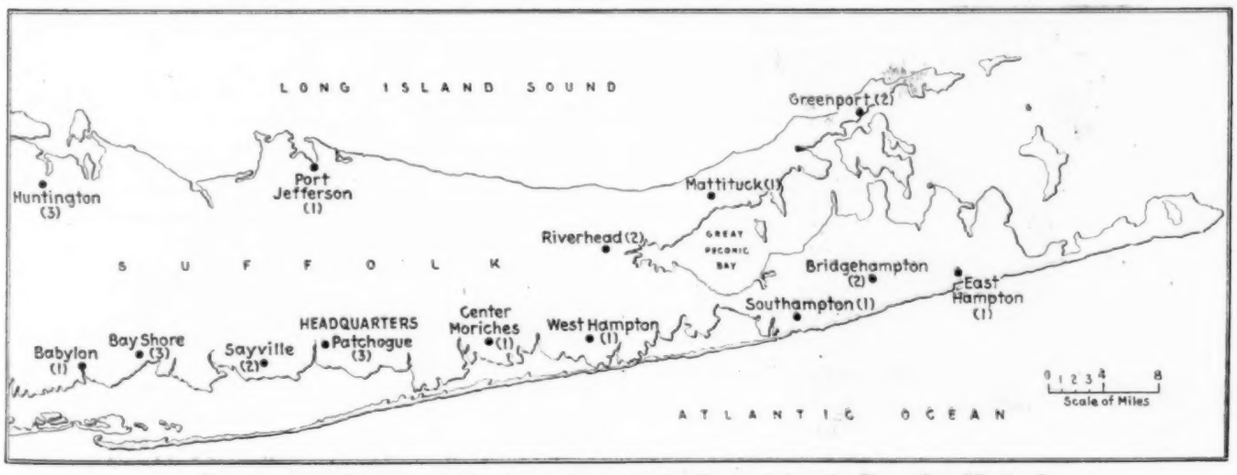
the job in the company garage where he has plenty of room and the necessary tools to make the repairs.

If, in an emergency, two or more trucks should be tied up, awaiting the mechanic, he is authorized to have the work done in a local garage or machine shop, it being a part of his job to know where he can have extra work done expeditiously and at a reasonable cost. While inspecting and tightening up the truck, the mechanic notes the evident care or abuse which it is receiving from the driver and, if necessary, instructs him in correct lubrication or calls his attention to bad driving habits.

Two steel boxes, 20 inches wide, 18 inches deep and

Table 2—List of Parts and Supplies Which the Mechanic is Required to Keep on Hand at All Times

25—SAE cast. nuts, ¼ in.
25—SAE cast. nuts, 5/16 in.
25—SAE cast. nuts, ⅜ in.
25—SAE cast. nuts, 7/16 in.
25—SAE cast. nuts, ½ in.
100—Lock washers, ¼ in.
100—Lock washers, 5/16 in.
100—Lock washers, ⅜ in.
100—Lock washers, 7/16 in.
100—Lock washers, ½ in.
100—Cotter pins, 3/32 by 3 in.
12—Copper hose clamps, 1¼ in.
12—Hack saw blades, 12 in.
25—Ft. primary ignition wire
25—Ft. secondary wire
1—Lb. water pump packing, ⅛ in.
10—Fuses, 5 amp.
10—Mazda bulbs, 21 C.P., 6-8 V., S.C.
6—Mazda bulbs, 4 C.P., 6-8 V., S.C.
6—Mazda bulbs, 2 C.P., 3-4 V., S.C.
6—Carriage bolts, ⅜ in. by 3½ in.
6—Carriage bolts, 5/16 in. by 2 in.
12—USS cap screws, ⅜ in. by 2½ in.
12—USS cap screws, ½ in. by 2½ in.
5—Lb. white waste
3—Lb. white lead
1—Dow switch
5—Lb. rags
6—Ft. radiator hose, 1¼ in.
1—Dietz Sentinel electric lamp
1—Electric push base tail lamp
2—Fan belts
2—Cylinder head gaskets
12—Champion spark plugs, ⅞ in.
2—Mirrors
2—Radiator caps
1—Mechanical hand horn
10—Ft. copper tubing, 7/16 in.
2—Valve springs
4—Exhaust gaskets
2—Radiator carrier springs
1—Crank handle
2—Tie rod bolts
2—Front shackle bolts
2—Signal arms
3—Brake rod clevis
2—Lb. strip solder
6—Sheets emery cloth, No. 1
1—Flat smooth 14 in. file
1—H. R. 14 in. bastard file
2—File handles
5—Oz. grinding compound
3—Sq. ft. Wisoid packing, 1/16 in.
2—Rolls friction tape
2—Rolls rubber tape
50—Flat washers, ¼ in.—1 lb.
50—Flat washers, 5/16 in.—1 lb.
50—Flat washers, ⅜ in.
50—Flat washers, 7/16 in.
50—Flat washers, ½ in.
12—USS cap screws, ¾ in. by 2½ in.
12—USS cap screws, ⅞ in. by 2½ in.
2—Front spring clips and nuts
2—Gov. rod ball socket joints
1—1-Gal. screw top can
1—Gal. Pyrene fluid
2—Hand brake lever pawls
2—Fan belts
4—Coil units
1—Set of lighting wire
2—Head light glasses
2—Spindle conn. rod yoke balls
2—Gasoline tank filler plugs
3—Cylinder head gaskets
3—Cylinder head outlet gaskets
12—Inlet and exhaust pipe gaskets
2—Breather pipes
12—Inlet and exhaust pipe glands
24—Large wire terminals
12—Small wire terminals
1—Gal. Lockheed oil



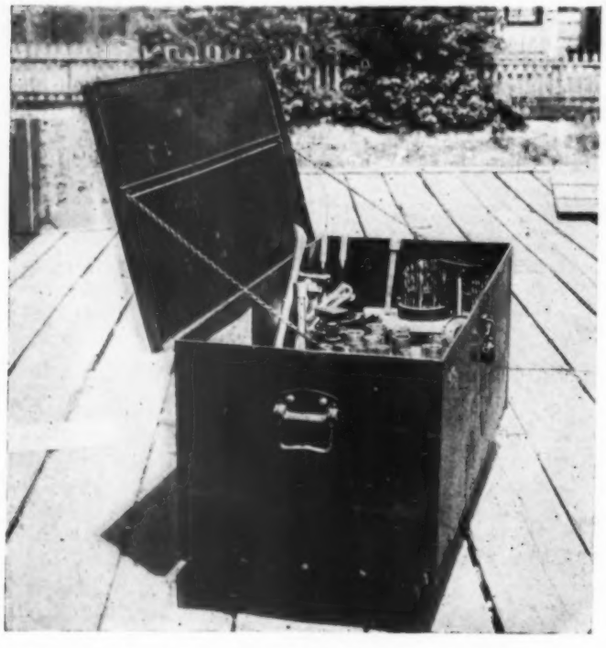
Towns, with Number of Trucks in Parenthesis, Covered by the Traveling Mechanic

The Parts Box Has Two Compartment Trays

44 inches long, mounted on casters and fitted with covers which can be locked, are an important part of the mechanic's equipment. These boxes have side handles and can be readily rolled on or off the truck. One serves as a tool box, containing a complete assortment of small tools and the other is used for spare parts and supplies,

Table 2—Continued
Special Parts for Ford 1½ Ton Trucks

4—Rear service brake shoe assembly	3—Oil filler cap assembly
2—Rear service brake retracting springs, short	6—Cylinder water outlet connection gaskets
4—Rear service brake retracting springs, long	2—Cylinder water inlet connections
2—Rear brake cam shaft springs	6—Cylinder water inlet connection gaskets
2—Rear brake rod clevises	3—Water pump gaskets
2—Rear brake rod springs	3—Fan belts
2—Emergency brake band and line assembly	2—Gas tank filler cap assemblies
2—Rear axle housing caps	6—Carburetor gaskets to manifold
6—Rear axle housing cap gaskets	1—Ignition coil assembly
1—Speedometer cable	2—Tail lamps
3—Hand brake lever pawl rod springs	4—Headlamp lenses
	2—Horn assemblies
	1—Battery cable to switch assem.
	1—Headlamp wire assembly
2—Hand brake lever pawl rods	6—Hood clamp assembly
6—Hand brake lever pawls	1—Instruction book A-AA
2—Hand brake lever bracket assem.	1—Parts book A-AA
6—Hand brake lever pawls	1—Distributor assembly
6—Cylinder head gaskets	2—Cylinder head gaskets
3—Cylinder front gaskets	1—Ignition coil
4—Valve chamber cover gaskets	1—Bendix starter drive
6—Oil pump gaskets	1—Starting motor switch
6—Oil pump clean out gaskets	4—½ in. Spark plugs
6—Trans. cover gaskets	



The Tool-Box Is Large Enough to Hold Pinch-Bars and 10-Ton Jacks

which experience has shown are desirable to have available when making minor repairs. A complete list of the tools and parts carried is shown in the accompanying table. Parts and supplies, used in making repairs, are replaced by requisition on the nearest division stock room, thereby keeping the supply always up to standard.

The mechanic works on a fixed schedule in covering the fleet of vehicles in his territory, which requires that he see each truck every 10 days. The schedule is arranged to eliminate, in so far as possible, time lost in covering the same ground twice.

Co-Ordination in Great Britain

(*Continued from page 1526*)

A highway route is generally more direct than the rail and the delay attending the various stages of transport by rail rendered this portion of railway traffic particularly susceptible to attack from an organized highway service which could offer a direct route from start to finish and combine the five stages into one. By using the motor truck as an auxiliary to a large extent the railway companies have been able to cut out some, if not all, of the transhipments in certain cases, resulting in improved transit. The introduction of the motor truck has added greatly to the utility of the express freight train services between large towns for it has enlarged their area of influence. Freight is now collected and run in to the main station to connect with the express service instead of being sent by rail from the smaller stations, with consequent delay and the missing of the fast through trains. The supplementing of an express night train service by daytime highway service therefore enables the railways to give greater satisfaction to their customers and effectively meet competition.

It will be seen that the British railways are facing the problem of rail and highway co-ordination for freight traffic in a practical manner. Their purpose is to develop highway services, both passenger and freight, as an integral part of their transportation system, but whereas on the passenger side they have relied upon co-operation and agreement with the independent motor coach companies, on the freight side they have decided to institute their own services to combat the severe competition from which they were suffering. This has meant a large increase in the road motor fleets owned by the railways. At the end of last year the London, Midland & Scottish owned 1,775 freight and parcel motor vehicles, the Great Western, 1,148; the London & North Eastern, 700; and the Southern 316. These numbers will be considerably increased as time goes on and the necessity for instituting new services becomes apparent.

A full development of railway facilities has been the primary consideration in meeting highway competition and efficiency of service has been aimed at. While the road powers they have been granted are secondary to the necessity of developing the carrying capacity of the railways to the greatest possible extent the railways fully realize that in the utilization of the highways as auxiliaries to the railways a policy of bold and vigorous development is essential.

New Equipment

Pickwick Duplex Coach Seats 53 Passengers

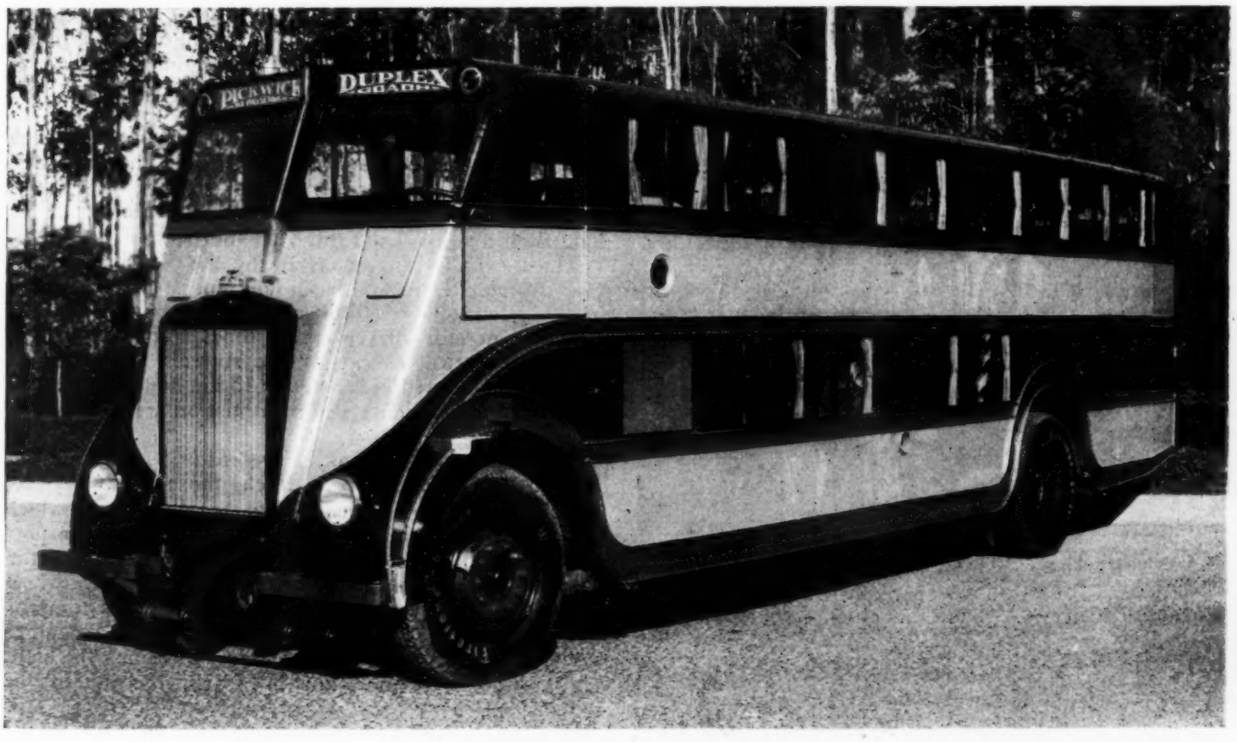
THE latest development in the motor coach field, offering greatly increased carrying capacity, is the new Pickwick Duplex, which has recently been introduced by the Pickwick Motor Coach Works, Los Angeles, Cal. This new coach has several distinctive features of design, the most important being the all metal, unit body construction, incorporating an interlocking seating arrangement; the built-in lavatory; the unusual driver's position, designed to give a clearer vision of the road; and the exceptional accessibility of the mechanical units. While it is said that the Duplex weighs no more than a standard coach and costs no more to operate, the increase in potential profit, due to its greater carrying capacity, should make it particularly attractive to those operators who have a large volume of traffic to handle. Its unusual appearance and the novel interior arrangement, which is designed to give comfort to the passengers, should, it is claimed, act as a stimulant to motor coach travel. The coach is 33 ft. long, 8 ft. wide, and 9 ft. 10 in. high, weighing, fully loaded, 25,000 lbs.

The seats, accommodating 53 passengers, are all individual reclining chairs, with the exception of the rear lounge, seating 5 passengers, and the two observation seats in the vestibule. There are 18 seats on the lower level and 35 on the upper level. Another feature of the seating arrangement is that there are only 16 seats facing to the rear; the remaining 37 seats face forward, thus largely overcoming the necessity of a passenger being forced to ride backward against his wish. A compartment may, however, be desirable for families or groups traveling together.

An unusual feature of the body construction is the aisle placed at one third of the distance between the upper and lower floors, extending from the vestibule to a point directly back of the rear axle. Entrance is obtained to the forward upper compartments by using a projecting step and to the lower compartments by a step down, located between the seats. The rear section of the coach has an upper aisle only. The drive shaft and other mechanical equipment connected to the rear axle are carried under the floor of the aisle.

A lavatory is provided on the left front side, located below the driver's seat. It is equipped with a toilet, a large china basin and a paper towel container.

Heating and ventilation is provided for with eight roof ventilators, in addition to the sliding windows, and by twelve individual hot water heaters, distributed between the upper and lower compartments. The heaters are placed along the outside walls where the cold is usually most noticeable. Hot water, from the motor cooling system, is circulated from the motor along the hot exhaust



Pickwick Duplex Motor Coach

pipe and through these radiators. Thermostats are installed to prevent overheating of the motor and to insure a sufficient supply of hot water for the heating system.

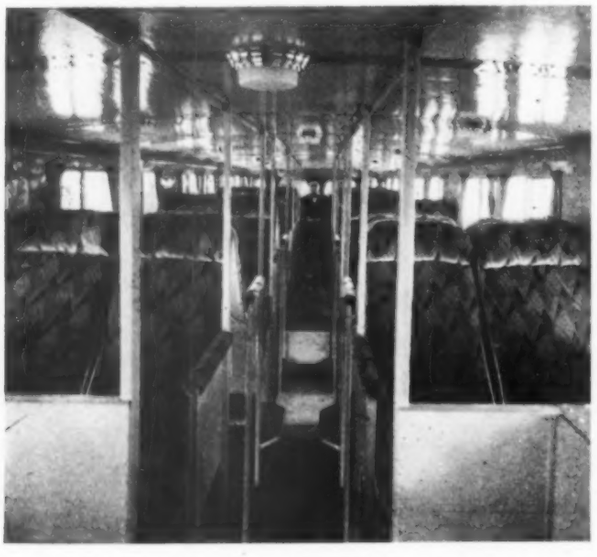
Two baggage compartments are provided. The largest having an area of 284 cu. ft., is located back of the rear axle and is entered through extra wide doors located on either side. These doors are large enough to admit medium size trunks, and are connected with signal lights located in the driver's compartment to prevent tampering. Two interior baggage compartments are also provided on either side in the center of the coach, each of these having a storage capacity of 14 cu. ft.

A buffet can be installed in the front entrance passage and meals can be served en route, if desired. For dining service or card playing, portable tables are provided which fit into special brackets in the compartments.

The body is of all-metal construction, built integral with the main chassis channels. These channels are 7-in. pressed steel sections running the entire outside length of the coach, and are tied together by fourteen cross members. The channels, which are located above and below the windows, form a solid guard rail to protect the coach. Pressed steel upright pillars are attached to the channels on the sides and to duralumin carlings at the roof. Two sets of duralumin body panels are attached to the frame, forming the inside and outside wall sheets. This double-sheet wall construction is used throughout with all cross partitions, bracings, etc., fastened to the inside sheet. Insulating material is placed between the inner and outer sheets.

The central aisle section is built up above the lower floor level, and is made of ⅛ in. duralumin plate running between the motor compartment and the rear wheel housing. From the aisle, uprights are carried to the roof, which, with the cross-compartment partitions and braces, give the body great rigidity. The roof construction consists of an insulating board, covered with well painted canvas, riveted to the cross channels. All windows except those in the driver's compartment have mohair drape curtains.

The driver's compartment is located directly over the front wheels and engine. The floor height is 60 in. above the ground. There is a broad, V-shaped windshield in two pieces, with narrow corner posts. It is claimed that these features give the driver a clear vision



A Step Is Used to Enter the Forward Upper Compartments

The Center Aisle Is Above the Floor Level of the Lower Compartments

of the road and reduce the confusing effect of headlight glare from on-coming vehicles. The driver's seat is adjustable, and in the same compartment are two stationary seats for passengers. The floor of the compartment is well insulated so that no heat from the engine can reach the driver.

The entrance door to the coach is 26 in. wide and 68 in. high and is operated by air, controlled from the driver's seat. For added safety, shatterproof glass is used in the windows and windsiheld. Twelve cp., individually controlled reading lights are placed directly above each pair of seats.

An innovation in power plant mounting forms a part of the Pickwick design. The six-cylinder engine, with control panel and accessories, the radiator, the clutch and the transmission are mounted as a unit on flange wheels and rubber ball cushion mountings. Two special incline rails lead to the front of the engine compartment and allow the power plant to be rolled out onto the floor or pavement. The entire unit can be removed in 15 minutes, it is said. A winch, located in the rear of the engine compartment, is used for drawing the unit back into position in the chassis. When in place, the unit is secured by self-centering wedge brackets and a pair of long right and left hand threaded shafts.

The 6-cylinder engine, made by the Sterling Engine Co., Buffalo, N. Y., and has a bore and stroke of 5¼ in. by 6 in., developing 150 hp. at 1500 r.p.m. An 800-watt, 12-volt generator, driven at 1½ times crankshaft speed, supplies electrical energy to two six-volt, 240 amp. hr. batteries, connected in series. A 13 in., double plate, dry disc clutch and a four speed transmission are mounted in unit with the engine.

The front and rear axles are made by the Timken Detroit Axle Co., Detroit, Mich. the rear axle being the new, model 59000, heavy duty, bevel gear type which was described in the May issue of the Motor Transport Section. The gear ratio is 3 8/15 to 1. Due to the absence of the usual frame construction, the entire wheel housing is open from one side to the other and the rear axle may be removed by raising the coach only enough to take the weight off the springs and by loosening the eight spring bracket bolts, in which condition the unit can be slid sidewise from under the coach. A Westinghouse, 6 cu. ft. air compressor, mounted on the engine, supplies three separate air reservoirs, which in turn supply three distinct braking systems, one being used on the front

wheels, one on the rear wheels and the third for emergency purposes operating through an extra diaphragm on the rear axle. The three braking systems, operated independently, are an added safety feature.

The rear springs are of a special four stage type, having double main leaves and double shackle bolts. The tires are 10.50 in. on 20 in. ventilated disc wheels. The wheelbase is 246 in.

Sterling Four Wheel Drive Trucks Have Large Capacity

THE Sterling Motor Truck Company, Milwaukee, Wis., announces the addition of two heavy-duty, four wheel drive trucks designed to carry heavy loads at high speeds. The two trucks are of the same design and construction, the model EWS-36, with a load capacity of 10 tons, having a proportionately smaller engine than the model EWS-40 which carries 12 tons.

The construction details of the larger capacity, model EWS-40 are outlined. The engine has a Ricardo type combustion chamber for increased efficiency. The bore and stroke is 5 in. by 5¾ in., giving 677 cu. in. displacement, and 126 h.p. is developed at the governed speed of 1800 r.p.m. The chrome-nickel steel crankshaft has four extra wide bearings and is provided with counter weights. All bearings are lubricated by a force feed system. Ignition is furnished by a magneto connected to an impulse coupling for easy starting.

The cooling fan has a diameter of 22 in. and is driven by two belts. The engine is suspended on three ball and socket supports.

The frame has 9 in. heavy channel section, pressed steel side rails with a wood-inlay which, it is claimed, reduces vibration and gives the frame added strength. Two tubular reinforcements are placed over the four wheel drive unit for extra stiffness. Bolts are used instead of rivets for all frame connections. The outside width of the frame is 38 in.

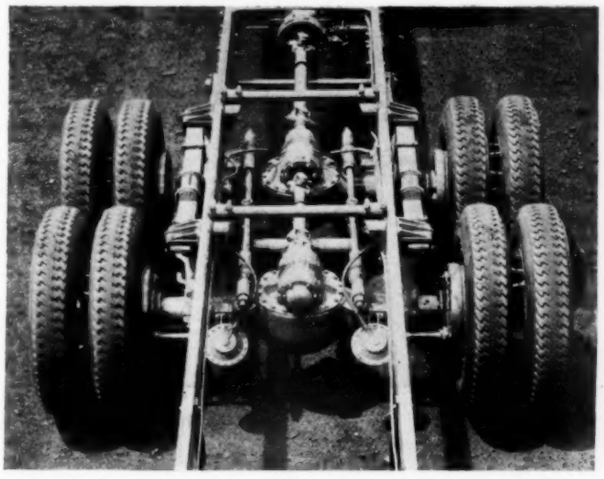
The heavy-duty, multiple disc clutch has 14 driving discs, and is mounted in unit with the four-speed sliding gear transmission. An auxiliary three-speed transmission is mounted on the frame, amidships, back of the cab, giving a total of 12 forward speeds.

The two full floating, worm drive type rear axles are made by the Timken-Detroit Axle Co., Detroit, Mich., and have a reduction of 9 to 1. I-beam radius rods transmit the driving and braking forces to the frame. When equipped with 40 in. pneumatic tires, the road speed, in direct drive, is 24 m.p.h. and, in the overdrive, 30 ½ m.p.h. The road clearance with standard tire equipment of the front axle is 13 in. and of the rear axle 10 in.

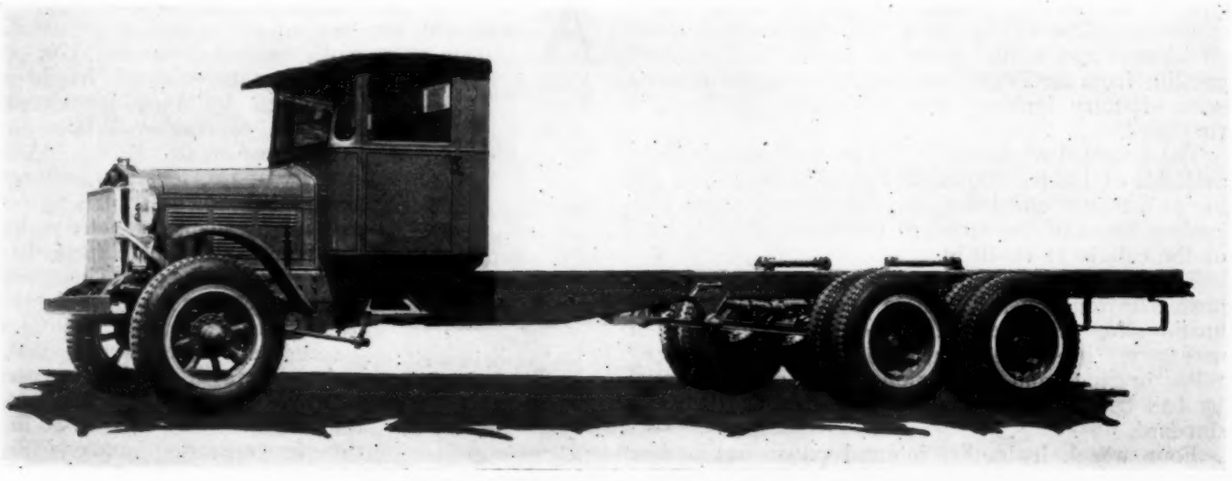
Westinghouse air brakes are used, having 146 sq. in. of braking surfaces on each rear wheel. The emergency brake is mounted on the propeller shaft.

The front springs have 14 leaves, 3 in. wide, and the rear springs have 20 leaves, 4 in. wide. The gasoline tank, mounted under the driver's seat, holds 27 gal. and is connected to the carburetor by a large vacuum tank. Standard equipment includes a hubodometer, air cleaner, oil filter, gasoline cleaner and oil gauge.

Special equipment consisting of starter, generator and electric lights, radiator guard, cab and towing devices, is available at extra cost.



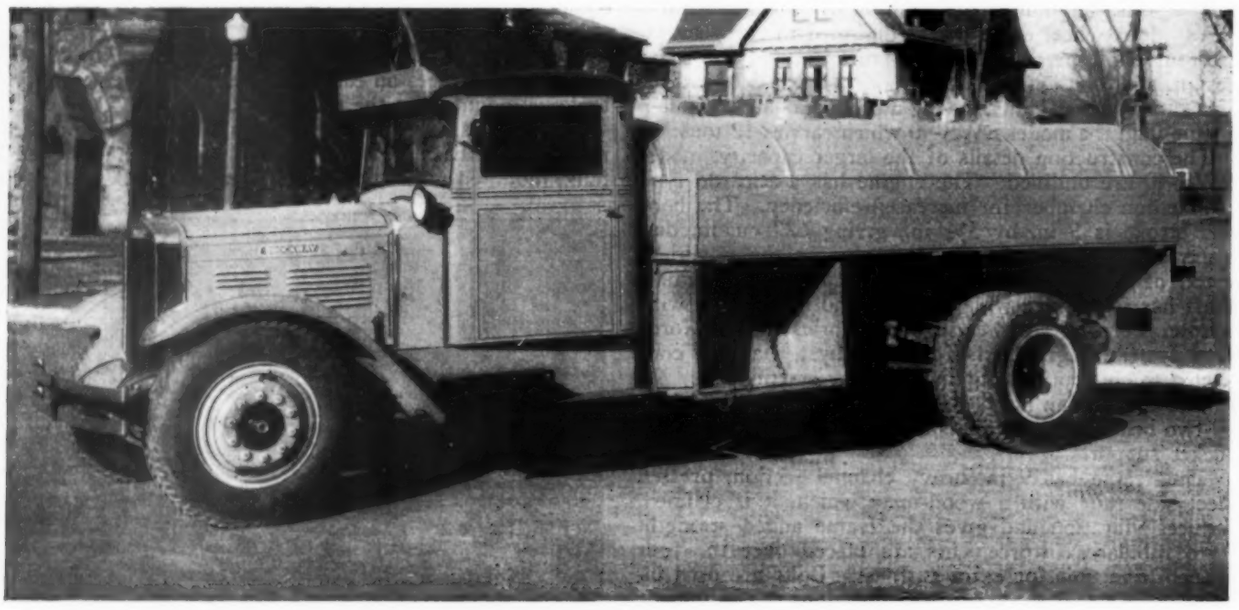
The Four-Wheel Drive Mechanism



Sterling Model EWS-40 Four Wheel Drive Chassis

Brockway Announces Double Reduction Drive Trucks

THE Brockway-Indiana Motor Truck Company, New York, has recently brought out a series of six-cylinder, double reduction drive trucks ranging in gross weight capacity from 14,000 to 22,000 lb. The four new models are of identical basic design, the important feature of which is the full floating, double reduction type rear axle. The model 220 has the greatest carrying capacity and is equipped with a 100 h.p. valve-in-head engine which has a seven-bearing crankshaft and a chrome-nickel cylinder block. Three point suspension of the power plant eliminates the possibility of broken crankcase arms. With a bore of 4⅜ in. and a stroke of 4¾ in., the piston displacement is 427.5 cu. in., and the rated horsepower is developed at 2400 r.p.m.



Brockway Model 220 Double Reduction Drive Truck

Full force feed lubrication is provided for the main and connecting rod bearings, the camshaft bearings and the overhead valve operating mechanism. A special type of oil filtrator is built integral with the upper crankcase. The 1½-in. plain tube carburetor has an air cleaner and a fuel pump to furnish a supply of gasoline from the 29 gal. tank located under the driver's seat. Battery ignition with distributor and coil is furnished.

The standard wheelbase is 170 in. with other lengths available of 188 in., 200 in., 212 in., 224 in., 138 in. for use as a tractor and 156 in. for dump truck work. The loading space of the standard wheelbase chassis, back of the cab, is 11 ft. 10 in.

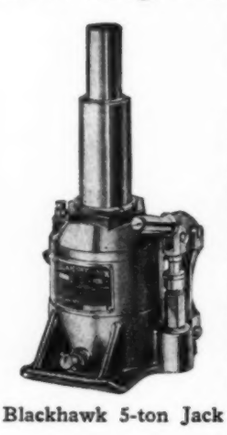
The double reduction gear drive rear axle has a malleable iron housing, cast in one piece, and is full floating, for quick replacement of the axle shafts, if necessary. The wheel bearings are supported by taper roller bearings and the pinion shaft and differential by ball bearings. A total reduction of 6.96 to 1 is standard.

Four wheel, hydraulic, internal expanding brakes, operated by a vacuum booster, are used, having a diameter and face, in the rear, of 17¼ in. by 5 in. and in front, 16 in. by 3½ in. The disc type emergency brake, mounted on the propeller shaft, has a diameter of 16 in. The frame is made of heavy pressed steel, heat treated, having seven cross-members which are hot-riveted in place. The dry, multiple disc clutch and the four speed, selective sliding gear type transmission are mounted in unit with the power plant. Pneumatic cord tires, 36 in. by 8 in., single front and dual rear, are standard equipment, with 40 in. by 8 in. pneumatic, optional at extra cost.

The chassis weighs 8200 lb. and the Deluxe type cab, furnished as extra equipment, weighs 650 lbs.

Blackhawk Tool Box Jack

A SMALL jack which will lift a full capacity load with one-hand operation and is also small enough to be easily carried in the tool box of a truck or motor coach, has been introduced by the Blackhawk Mfg. Co., Milwaukee, Wis.



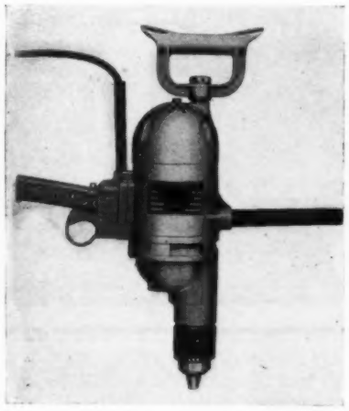
Blackhawk 5-ton Jack

The new model M 7.3 has a capacity of five tons and features exceptional lowness making it particularly adapted for use under low front axles where large diameter tires are used. The range of lift is between $7\frac{5}{16}$ in. and 14½ in. A sled-type base facilitates placing and removing the jack, and a serrated saddle, integral with the upper plunger, reduces the danger of slipping. A 34 in., two-piece operating handle is furnished, and also a lantern-type handle for carrying the jack.

Sioux Electric Drill

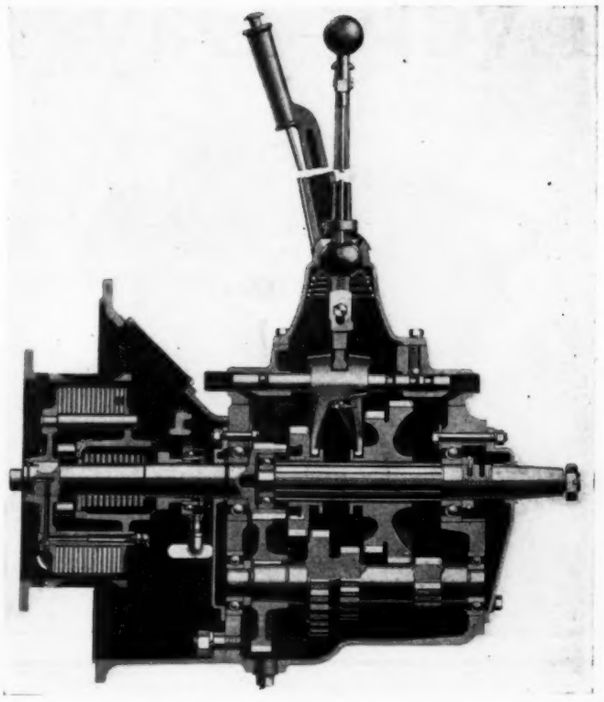
A HEAVY-DUTY, portable electric drill which has a chuck capacity up to ¾ in. has been introduced by Albertson & Co., Sioux City, Iowa. This drill is very powerful for its size, and has the extra capacity frequently found necessary in making truck and motor coach chassis repairs.

The body of the drill is an aluminum die-casting with a hard surface which will not collect grease. Chrome nickel steel, helical-cut gears give quiet and smooth operation and the oversize electric motor has a system of ventilation which prevents overheating when the drill is in continuous operation.



Sioux ¾-in. Heavy Duty Electric Drill

A momentary two-pole switch is arranged so that it may be held in contact by means of a trigger or by locking the contact when the drill is in use for a period of time. The motor and the chuck spindle are mounted on ball bearings to assure easy running qualities.



Fuller Model MGU Transmission

New Fuller Transmission

A MEDIUM-DUTY transmission designed particularly for use in 2 to 3½-ton trucks and in 15 to 21-passenger motor coaches, has been recently announced by Fuller & Sons Manufacturing Company, Milwaukee, Wis. The maximum engine size recommended is 386 cu. in., and the maximum chassis weight is 6,500 lb. The model MGU transmission features several improvements in details and a choice of three optional gear ratios. The wide-faced gears are selected from matched pairs which have been tested for quiet running qualities. All shafts run on annular-type ball bearings to eliminate any change in adjustment due to expansion or contraction caused by temperature variations. The main-shaft is of large diameter and has ten splines. The first, second and third speed counter-shaft gears are forged integral with the shaft.

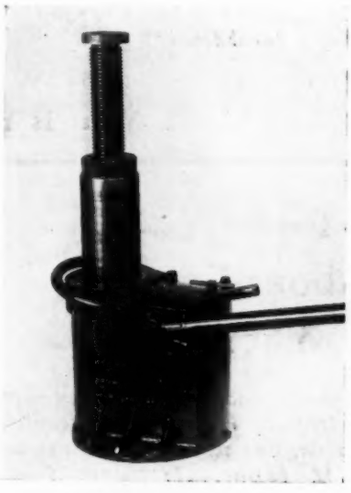
All gears and shafts are made of 3½ per cent nickel steel, case hardened, and the gear case is made of nickel cast iron. A new type of multiple-disc, dry-plate-type clutch is used, in which has been incorporated provision for positive lubrication of the clutch throw-out and the pilot bearings.

The rear bearing cover is arranged for a speedometer drive gear, and a power take-off with a standard S.A.E. opening is provided. Bosses are cast in the rear of the case so that, when specified, holes can be drilled and studs provided to take a disc-type hand brake. The bell-housing is furnished to fit no. 1, 2, 3 or 4 S.A.E. bell-housing standards.

The standard ratios are: first speed, 6.5 to 1; second speed, 3.7 to 1; third speed, 1.9 to 1; fourth speed, 1.0 to 1; and reverse, 7.8 to 1. Of the two optional ratios, one offers a smaller reduction and the other a third speed direct with fourth speed over drive.

Vickers Tool Box Jack

THE Vickers Manufacturing Company, Benton Harbor, Mich., has brought out a heavy-duty, hydraulic truck and motor coach jack, which has great lifting capacity but is compact and can be easily carried in the tool box. The jack is of unique design, due to the enclosure of all operating parts within the one-piece base. The total enclosure of these parts protects them from mud, grease and water, when in use under the coach, and from other heavy tools, when being carried in the tool box.



Vickers Hydraulic Jack

The handle operates from either side, permitting the jack to be placed close to the tire. The releasing mechanism is operated by a half turn of the handle and allows the load to be eased down gradually. A safety valve prevents overloading or damage from careless operation.

Every-Day Problems

of Motor Coach and Truck Operation

This Month's New Questions

Question No. 26

Road Failures and Their Prevention

"What have been the most frequently recurring causes of road failures? Have they been due to faulty design or installation of equipment, or to mishandling by the driver, or to careless maintenance? What action has been sucessful in reducing road failures? What is the average mileage between road failures? To what extent are drivers trained or equipped to make repairs on the road in case of a breakdown?"

Question No. 27

Getting the Patronage of Automobile Owners

"Granting that the railways' loss of passenger business has been due to the increasing popularity of automobile riding, what efforts are being made by railroad-operated motor coach lines to attract motorists to motor coach travel? To what extent is motor coach advertising or solicitation directed at automobile owners? Is the item of comparative cost of travel in an automobile and in motor coaches emphasized? What other arguments have been used to get these travellers? How successful have their efforts been?"

What Is Your Answer?

Replies to Question No. 22

What About Express Traffic?

"To what extent are motor coach operators attempting to develop express traffic? How is the solicitation of this business carried on, and what commodities are most frequently handled? Is the express moved only between stations, or is it picked up at the shipper's door and delivered to the consignee? Is a special express compartment in the motor coach necessary? Who collects shipping charges, and what is the basis of rates? Is express traffic profitable and worth going after?"

Does Not Solicit Express Traffic

We do not actively solicit express traffic for the reason that a heavy volume of such business takes up valuable passenger space in the coach and slows up the operation. Nothing is more obnoxious to a passenger than the impression that he is riding in a "delivery wagon," and a study of the matter has shown in some cases that a heavy express schedule brought about a decrease in passenger revenue.

Our only reference to express in advertising is contained in the pocket timetable folders. There is no display whatever in newspaper or other advertisements. Such express as we do handle consists principally of rush orders from supply houses to dealers, and a considerable volume of newspapers. Deliveries and pick-

ups are made only at our established agencies, charges being handled by the agents. Rates are based on weight and mileage.

The desirability of express business is a much debated question. From our viewpoint, it is desirable only in that the revenue derived from quantities that can be conveniently carried on existing schedules helps to build up the total revenue for the schedule, giving us the desired margin of profit over cost per mile to operate.

R. W. LEMEN,
President and General Manager, Oregon Stages.

Express Business Sought

The Union Pacific Stages solicit express business in connection with their passenger solicitation. Express service is mentioned in about fifty per cent of our advertising, and in the wholesale automotive districts of cities, special effort is made to secure shipments.

The commodities most frequently handled are ice cream, laundry and automobile parts. Express is handled only between stations, and the consignee is notified of arrival by phone. No special express compartment is maintained on any coach. In case of prepaid express, the receiving agent collects from the shipper. In the case of collect express, the shipping agent collects from the driver, who, in turn collects from the receiving agent, who collects from the consignee.

This company considers the express traffic highly profitable, as the shipments are nearly all small and can be handled without displacing any passengers.

WM. L. MCCREDIE,
General Agent, Union Pacific Stages.

Reply to Question No. 23

How Close a Check on Maintenance Costs?

"Is it worth while to determine maintenance costs currently for each vehicle, or is it as satisfactory merely to determine maintenance costs for the fleet as a whole? What efforts are made to check the day-to-day performance of each vehicle and each major unit in each vehicle? What employee is responsible for preparing maintenance cost data, and how much of his time is required for this purpose? Is the expense of keeping exhaustive cost records justified by the constructive use to which they are put? In other words, are detailed cost records actually used, or are they merely kept?"

Close Check Kept and Used

We are compiling each month a detailed maintenance cost record of each vehicle operated and of the major units of each vehicle. Such record is of considerable value, in that it enables us to put a finger immediately on the expensive items of maintenance and to take corrective action. Such a record indicates to us the worth of certain vehicles in certain classes of work, and the unit record quite often shows that the heaviest cost for a certain vehicle is caused by one particular unit, so that by making a simple mechanical change, considerable saving can be made.

We do not attempt to make a close check of the day-to-day performance of each vehicle or unit except in cases of special tests. Of course, a daily record is made of gas and oil consumed and mileage operated, and at the end of the month a recapitulation is made showing performance for the month and also the cost per mile.

The preparation of this cost data consumes approximately ninety per cent of the time of one clerk. We feel that the expense is fully justified because of the fact that the information derived is actively used in the economical conduct of the business.

R. W. LEMEN,
President and General Manager, Oregon Stages.

Replies to Question No. 24

What Steps to Avoid Accidents?

"What steps are taken by motor coach and motor truck operating companies to insure safe operation? Since safety depends partly on maintenance, what duties bearing on safe operation are charged to this department? Since the driver is the key man in motor vehicle operation, what training, supervision or operating requirements is he subjected to? How is the obedience of safety rules compelled? What other precautions or policies are in force to insure safe operation?"

"Safety Above All Other Things"

The maintenance department of the West Virginia Transportation Company is definitely charged with the responsibility for keeping our motor coaches in such condition that they will be absolutely safe for operation. A regular inspection routine is, of course, set up, whereby certain prescribed inspections are made at definitely assigned times. In addition to that, each coach is thoroughly inspected before being permitted to leave the garage for service. Inspections are made where conditions permit when motor coaches reach the terminal points at the ends of runs during their day's tour of duty.

So far as the drivers are concerned, they are examined very carefully before being employed, being given tests as to their mental ability and alertness and a medical examination, which require the same standard of fitness as required for men in the train service of the Baltimore & Ohio. Before being permitted to go to work, they are taken over the route they are to cover, accompanying experienced operators. They are not permitted to run alone until the management is assured that they are thoroughly conversant with the character of the territory they are to cover. They are, of course, expected to obey all traffic rules, stop at grade crossings, keep within prescribed speed limits, and to handle their motor coaches in a sane, safe manner.

It is understood by our operators that flagrant violations of safety rules mean immediate dismissal, or any minor violations, in discipline. Any recurrence of a safety violation means dismissal.

Our supervising officers call the attention of our operators to all motor coach accidents that come to their notice, so that they may be impressed with what has happened to other motor coach lines, and so that the same things will not happen on our own operation. Safety bulletins are also furnished them, and the subject of "safety" is continually before them. In addition, our supervisors, who are riding all the time, keep a close check on the actions of our operators in so far as the safety feature is concerned.

Our slogan to the operators is "Safety Above All

Other Things," and they are instructed that first and foremost of the things we demand of them is safety of operation, and that everything else must be subordinated to that.

M. F. STEINBERGER,
Manager Highway Transportation, Baltimore & Ohio.

130,000 Miles per Accident

Marcus Dow, formerly head of the National Safety Council and for 13 years director of safety for the New York Central lines, is manager of the Department of Safety and Personnel of the Greyhound Lines. When he came with the company in July of last year, we were operating 10,000 miles per accident. In April of this year, we were operating 130,000 miles per accident. We classify an accident as any contact of the coach with another object or vehicle. A scratched fender is considered an accident.

The greatest care is used in the selection of the driver. He must be at least 25 years of age, at least 5 ft. 8 in. in height, and must weigh at least 165 pounds. He must undergo a physical examination by a competent physician whose recommendation must be favorable. He is then put through a training school. The period of training is usually about 30 days, depending somewhat upon his previous experience. He first learns how to operate a motor coach under the guidance of an old experienced driver. He attends class instruction. He spends an allotted time in the shop learning how to make minor repairs and adjustments. Each day during the training period, safety is stressed. Rules are explained, and he is examined as to his knowledge of them. Safe practices in driving are thoroughly drilled into him. At the end of his training period, a driver observer, employed in the Department of Safety and Personnel, accompanies him on a trip with an empty coach, observes him as he drives over both city streets and country roads, and either recommends or disapproves him for employment. His final approval for employment, in other words, is based upon the care with which he handles his coach and the faithfulness with which he observes all safety rules.

Among other things, then, motor coach drivers are required to stop before crossing any steam or interurban railroad and open the door, look and listen for trains, and never proceed until absolutely certain no train is approaching, and then to start in a low gear, and not shift gears until the tracks have been crossed. They are required to slow down when approaching all highway intersections where the view is poor, or where other vehicles are approaching from an intersecting highway, regardless of whether or not they think they have the right-of-way. They are prohibited from attempting to pass other vehicles going in the same direction on curves or hills. They are limited in speed to whatever the legal requirements may be in state or municipalities through which they run, but are prohibited from exceeding 40 miles per hour under favorable operating conditions in any state where the law does not require a lesser speed.

These are but a few of the important safety rules our drivers must observe. Supervisors are stationed at intermediate points on all routes, whose duty it is to watch the coaches, follow them in their own cars, and stop the coaches as may be advisable to instruct, caution and warn drivers when road conditions require special care to prevent mishap. These supervisors are also required to see that all safety rules are observed by motor coaches while traveling in their respective territories.

Secret service men, who pay their fare but are in the employ of the company and are unknown to the drivers, ride as passengers and report safety violations. This is an extreme precaution that is taken to protect the traveling public. Major violations are severely dealt with. Failing to stop at railroad crossings and speeding, when apprehended, mean instant dismissal from the service, and the drivers know that no excuse will be accepted for either of these offenses.

The past accident record of each driver is carefully watched. A monthly statement is furnished by the manager of the Department of Safety and Personnel to each superintendent, giving the name of each driver who has had an accident, no matter how trivial, during the past month, and included in the statement is information as to how many previous accidents such driver has had and how many he was at fault for. Upon receipt of this information, the driver is called in by the superintendent, and his record gone over. Three "at fault" accidents, no matter how slight, put the driver on probation. He is further trained, watched and instructed. If his record continues unsatisfactory, if he is, in other words, found to be "accident-prone," he is dismissed from the service.

Supplementing this strict supervision of drivers, every known effective method is used to inspire and encourage the men to voluntarily strive for a good safety record. A division safety contest is held throughout each year. Every three months a silver trophy is awarded to the division having the best record on the basis of the number of accidents per thousand miles. Silver pins are given the individual drivers on the winning division at a banquet the company arranges in their honor. In addition to the division contest, team contests are held on each division for an award given by the superintendent to the group of drivers in his own division showing the best record. Drivers are individually rewarded by the management for having clear records of no "at fault" accidents, by the payment of a monthly cash bonus. "No accident" buttons are given drivers, a bronze button for a six-month, and a gold button for a one-year record without accidents.

The construction of the coaches themselves has been given close study from the standpoint of safety, and all new equipment contains many important safety features. Gas lines are arranged to carry the fuel away from exhaust pipes and other heated parts, to prevent fire. Every coach must, nevertheless, be equipped with a hand fire extinguisher and rear emergency exit door.

Although every precaution is taken to prevent accidents, our specifications for coaches now require that they must be built to guard against serious injury in case an accident does happen. In addition to the extra heavy chassis frame, each coach has a special "fender" frame built entirely around the body underneath the extra body panels. This frame prevents the body panels caving in and injuring passengers in case of a side-swipe collision. In other words, the coaches are armor plated. The lower portion of the coaches, or that portion which encloses the passengers, is almost entirely of steel construction. This construction is reinforced from all possible angles.

The coaches are so sturdily built that they may be thrown over completely and stood on the roofs without any perceptible strain or weakening. Specially selected hardwood, which is oil-impregnated for strength, is used in the construction of the roof and those other parts requiring wood construction. The frame and body itself are reinforced by six heavy steel cross members, which act to resist torsional strains. All of the later type coaches are equipped with shatter-proof glass, which will not crack and fly under the severest of im-

pacts. Improved-type steering apparatus makes control of the coach as easy as driving a light automobile. Brakes are tested in brake-testing machines before coaches are permitted to leave the garage.

JOHN B. WALKER,
Sales Manager, Greyhound Lines.

Supervision, Maintenance and Attitude of Drivers

Among the many factors governing safe operations there are three that are outstanding, namely: supervision, maintenance and the mental attitude of the drivers. We employ a "driver instructor" who acts in a supervisory capacity under the superintendent of transportation. In his hands rests the responsibility for proper instruction of new drivers as to our methods and requirements, and in addition he is constantly on the lookout for any carelessness or unsafe practices that may develop among the entire driver personnel. He carries full authority to correct immediately any irregularities uncovered.

The duties of drivers are set forth in a book of rules in which are incorporated, by reference, the motor vehicle laws of the state. A pocket edition of the law is furnished each driver, and he may be quizzed on his knowledge at any time by the instructor. We require that a full report of an accident or near-accident must be made to the supervisor immediately at the end of the run, or, if the seriousness of the case demands it, a telephonic report from the scene of the accident. Here is where the mental attitude of the driver enters into the question. If the men can be brought to a thorough realization of the extreme importance of the most trivial irregularity, the battle is half won; because if that thought is held uppermost, there is a natural reaction toward avoidance of any practice which may lead to difficulties.

Our disciplinary methods for securing the desired results in this matter are flexible; that is to say, we do not always assume the arbitrary attitude that some form of punishment, so to speak, is required for every infraction of the rules. On the other hand, we have found that a policy of showing the men the reasoning behind the requirements and the results of not living up to them, has brought about a realization of their responsibilities and a sincere desire to carry on in a commendable manner. Of course, there are instances that obviously call for severe discipline, and they are handled accordingly, but we are proud to say that such cases are few and far between.

Proper maintenance is the next important factor in safe operation. Both driver and mechanic play an important part. The driver is operating the car under all sorts of conditions, and it is within his province to find certain trouble under certain conditions. For the purpose of recording his observations, there is placed in every coach a defect report to be made in triplicate. At the end of his run, the driver fills out and signs the report, sending the original in with his trip report. The duplicate and triplicate he leaves in the car for the mechanics at the garage where the car is turned in. If there is some defect, either real or suspected, the driver indicates his opinion on the report. The mechanics examine the unit and make necessary repairs or adjustments and state on the report the work done. The duplicate is then signed by the foreman and sent to the superintendent of maintenance, and the triplicate is placed back in the car as a clearance for the next driver, showing that the defects reported by the previous driver have been corrected. A new set of reports is installed for the next trip. This report gives us a constant check on the condition of coaches so that minor difficulties can be corrected from day to day. If no defects are found by the driver, he marks his defect report "O.K.," but regardless of such a report the coach will receive a thorough checking up before being sent out on its next run.

Then, in addition to the running inspection, every coach is subject to our rigid maintenance schedule, whereby at regular mileage intervals certain units are thoroughly examined; and when the coach reaches a stated limit, it is shopped for general overhaul.

R. W. LEMEN,
President and General Manager, Oregon Stages.

Replies to Question No. 25

Developing Summer Tourist Traffic

"To what extent are railway motor coach operating companies attempting to develop special summer tourist traffic. What special service is being provided, and are special rates allowed? Are tours run on all-expense basis or otherwise? To what extent is railway service utilized in connection with the tours? How is this traffic solicited and what advertising is done? If similar service has been offered in previous years, how successful has it been?"

D. & R. G. W. Starts Tours Service

Special attractions and all-expense tours from Grand Junction or Montrose to Mesa Verde National Park and return, via the Chief Ouray Highway, are being advertised by the Rio Grande Motor Way, Inc., in connection with the Denver & Rio Grande Western. Regular tariffs have been published and special literature is now in course of preparation. This company is also featuring motor trips, either detour from Colorado Springs or Parkdale, and a circle trip from Colorado Springs to the Royal Gorge and return via the Suspension Bridge over the Gorge.

Our railroad traffic force is being utilized in the solicitation of this business. This is our first undertaking of this character.

F. A. PEIL,
Assistant to President, Denver & Rio Grande Western.

Pennsylvania Continues Tours

During the summer of 1929, the People's Rapid Transit Company, now under our supervision, operated a series of all-expense tours from Philadelphia to Buffalo and Niagara Falls, to Montreal and Quebec, and to New England, including the White Mountains, on the basis of a combination of regular fares, plus the charge for hotel accommodations and other features. Similar tours were also operated from Philadelphia to Washington, New York and Atlantic City.

Special P. R. T. motor coaches were operated, except between Buffalo and Niagara Falls, where the electric line was used, and between Montreal and Quebec, where a trip by steamer was included. No railroad service was utilized.

Advertising was accomplished by means of illustrated folders and through the newspapers. The revenue received from these tours was quite satisfactory and arrangements have been made to operate them again this year under similar conditions.

C. H. MATHEWS, JR.,
General Traffic Manager—Passenger, Pennsylvania.

Motor Transport NEWS

Katy Forms New Subsidiary for Highway Freight Service

Missouri, Kansas & Texas Transportation Company to provide store-door collection and delivery at a number of points in Texas

The Missouri-Kansas-Texas has organized a subsidiary, the Missouri, Kansas & Texas Transportation Company to provide store-door collection and delivery service at a number of points in Texas, the service being operated in a way similar to that of the Pacific Motor Transport Company in California and the Texas & Pacific Motor Transport Company in Texas. In announcing the organization of the transportation company, the officers of the M. K. T. made known its purpose to institute a freight express service in the state of Texas. Under the Katy freight express service plan there will be no operation of motor trucks.

The railroad company contracts with the Missouri, Kansas & Texas Transportation Company to handle its freight business and the transportation company in turn contracts with existing Dray Lines in the communities served to pick up outbound freight and bring it to the railroad station and to deliver inbound freight to consignees. This service has to do with l. c. l. exclusively.

Initially the company goes into only 27 of the larger points on the M. K. T. Lines in Texas but the tariffs of the transportation company are so devised that the service may be extended.

The chief field of operations of the transportation company is Dallas and Fort Worth to Wichita Falls, from Dallas and Fort Worth to Denison via Greenville, from Dallas and Fort Worth to Temple; between San Antonio and Smithville and Houston and Smithville.

The service as far as the railroad company is concerned will be handled in its present package cars.

The Missouri, Kansas & Texas Transportation Company is designed to supplement only the freight train service of the Katy. It owns and operates no motor cars and it is not at present the purpose of the company to engage in the motor transport business.

The whole purpose of instituting the new service through the Missouri, Kansas & Texas Transportation Company is to preserve and extend if possible the l. c. l. service of the railroad company in the communities served directly by the Katy Lines. It is the present purpose of the railroad company to confine its activities of this character to the state of Texas but if conditions make it necessary or desirable the company is prepared to extend its freight express service into Missouri, Kansas and Oklahoma, the other three states served by the Missouri-Kansas-Texas lines.

Coach Substitution for Trains Allowed on Central of Georgia

The Public Service Commission of Georgia recently granted the Central of Georgia permission to substitute motor coach service for existing train service between Savannah and Tybee, Ga. The order permits the substitution only during the winter months when rail traffic on this route is light.

This commission also recently granted the Georgia Highway Transportation Company authority to operate motor truck service between LaGrange and Columbus and authorized the Monticello Bus Company to operate coaches between Macon and Monticello and Gray.

Publicity of N. J. Independent Stresses Its Drivers' Freedom

The freedom of its motor coach drivers from duties other than that of operating the motor coach, is stressed in a publicity circular recently distributed to its passengers by the De Camp Bus Lines, a New Jersey independent.

Under the heading "A Bus is No Better Than Its Driver" this circular points out that it is the job of the De Camp driver "to take you safely, comfortably and with dispatch over the direct routes of the De Camp Bus Lines. He does not collect fares en route. He doesn't have to keep a set of books while he's driving."

Monon Subsidiary Formed For Road and Air Service

The Chicago, Indianapolis & Louisville has filed incorporation papers with the secretary of state of Indiana for the Monon Transportation Company which has been organized for the purpose of engaging a motor coach and air transportation. At the time of the filing of the incorporation papers it was stated that the formation of the company is a step necessary to enter these new transportation fields, such as the Pennsylvania has already taken through the Greyhound motor coach lines.

$3,000,000 Coach Order of Railway Affiliates

Pacific coast companies now receiving deliveries of 200 new vehicles

Delivery of 200 modern motor coaches, representing an investment of $3,000,000, is in progress or has been made to the Pickwick Greyhound Lines and Pacific Greyhound Lines, according to a joint statement recently issued by Charles F. Wren and T. B. Wilson, presidents respectively of the two companies. Approximately $2,000,000 of the foregoing amount represents new equipment designed for use throughout the Pacific Coast and Rocky Mountain territory, while the balance is for use on Pickwick Greyhound lines east of Denver, Colo.

The bulk of the order, according to the statement, went to the General Motors Truck Company which supplied 110 of the new coaches costing $1,650,000; the C. H. Will Corporation of Oakland, Cal., supplied 75 coaches valued at $1,125,000. The balance was ordered from the Pickwick Motor Coach Works of Los Angeles, Cal.

In connection with the operation of this latter company, the statement says that its orders on hand or in prospect indicate that the Pickwick factory within a few months will have completed and sold motor coaches representing a total value of more than $3,000,000.

Of the 75 coaches ordered from the C. H. Will Corporation, 50 have been delivered and are in service on the Pacific Greyhound Lines in California and Ore-

(*Continued on page 1548*)

Illinois Central Free Cab Transfer at Bloomington

The Illinois Central in an effort to meet motor coach competition recently announced that it would provide free taxicab service between its station in Bloomington, Ind., and the University of Indiana to students of that school. The plan was outlined in a recent letter from Illinois Central attorneys to the Public Service Commission of Indiana and made public by Commissioner Calvin McIntosh.

By transporting students directly to the University grounds for no additional price over the railroad ticket, it is hoped to regain some of the business which has been lost to motor coach lines serving towns along the railroad, the letter pointed out.

Passage of Parker Bill Still Remains Doubtful

Makes little progress in Senate since recommittal and new favorable report

The Parker bill (H. R. 10,288) providing for the regulation of interstate motor coaches, which was passed by the House of Representatives on March 24, has made little progress in the Senate since the publication of the *Motor Transport Section* of May 24 wherein it was predicted that the present Congress was unlikely to adopt this regulatory legislation.

Following the announcement that the Senate steering committee had, because of the controversies which had arisen around the measure, eliminated it from the program of bills listed for consideration before adjournment, the Parker bill was, on May 20, recommitted for further consideration by the Senate committee on interstate commerce.

This body had requested the recommittal thinking that some of the controversial features might be eliminated. On May 23, however, the bill was reported back to the Senate with no changes, the report merely reaffirming the previous favorable action of the committee.

Later it was decided by the majority steering committee to re-establish the Parker bill on its calendar. In such a case, however, its disposition must await the action on several other bills including such highly controversial measures as the pending tariff, and rivers and harbors legislation.

Thus, with the adjournment of the present session now approaching and a special session for action on the London naval limitations treaty impending, it is quite likely that the Parker bill will not be reached or, if it be reached and a controversy develops over it, attempts to pass it are quite apt to be abandoned altogether.

I. C. C. Bureau of Safety Reports on the Recent New Mexico Accident

Director Borland holds motor coach driver responsible for fatal grade crossing collision with Santa Fe train

While pointing out that motor coaches are involved in a very small percentage of grade crossing accidents, W. P. Borland, director of the Interstate Commerce Commission's Bureau of Safety, nevertheless held, that when they are involved, "the results are apt to be so serious as to justify the taking of every possible precaution to avoid repetition," in his recent report of the collision between a Pickwick-Greyhound Lines motor coach and an Atchison, Topeka & Sante Fe train, which resulted in the death of 21 of the motor coach passengers and its driver, near Isleta, N. M., on April 11.

"This accident," Director Borland's report stated, "was caused by a motor coach being driven on the track directly in front of an approaching train, for which Driver Williams is responsible.

"The investigation developed that the bus approached the crossing at slow speed, was turned sharply to the left just before reaching the crossing, and stopped with its forward end across the track, at a point 55 feet east of the center line of the crossing, where it was struck by the train a few seconds afterwards. There is a railroad warning sign located 496 feet from the crossing which gives advance notice of the approach to a crossing, and there is another sign near the crossing which directs traffic to stop, which is also a requirement of the State Corporation Commission in connection with the operation of common-carrier motor vehicles, as well as being a requirement of the Pickwick-Greyhound Lines. Under these circumstances, in daylight, and with the sun shining, and in view of the fact that the driver of the bus, when 472 feet from the crossing, could have seen a train more than 1,800 feet distant, there would appear to be no excuse for his action in failing to prevent an accident. One of the passengers on the bus said the driver looked to the left while approaching the crossing, but did not look to the right until the bus had nearly reached the crossing, and the fact that it was not until then that the driver finally realized a train was approaching from the right, is evident from his action at the last moment in turning the bus off the roadway.

"The bus involved in this accident had been operated from Albuquerque to Gallup on the day prior to the accident, and the driver who operated it on that run stated that it was in good condition, with brakes and motor operating satisfactorily, while the general manager of the Pickwick-Greyhound Lines, in a letter to the Commission's inspectors under date of April 15, stated that the bus received a regular inspection and greasing in the shops at Gallup. Driver Williams had arrived in Gallup at 4:10 p.m., April 10, and departed from Gallup on the trip on which this accident occurred at 4:30 on the morning of the accident; he was considered an experienced man, and had been operating a bus in this particular territory for a period of several months.

"There are two features in connection with this accident, concerning which no definite information is available; first, there was some evidence that there was a woman riding on the seat with the driver and that he had been talking with her en route, and, second, there was also some evidence to the effect that the motor had stalled on several occasions when the driver was trying to start the bus. To what extent either or both of these conditions may have been responsible for diverting the driver's attention, is something which is only a matter of conjecture. It is possible that neither of them had any influence on him, but if that were the case, then it is difficult to account for his apparent failure to notice the approaching train until the bus was too close to the crossing to be brought to a stop in safety.

"The question of the occurrence of accidents at highway grade crossings is one which warrants the most serious attention, as is evidenced by an annual toll, approximately, of 2,500 killed and 6,700 injured. Accidents involving busses have furnished a very small percentage of these casualties, but when they do occur, the results, as in this case, are apt to be so serious as to justify the taking of every possible precaution to avoid repetition. In the present case, there is no definite proof that the bus or its driver were not in proper condition for the safe transportation of the passengers. Nevertheless, the occurrence of this accident calls for an ever-increasing vigilance on the part of supervising officials of bus companies to see that even more care and attention are given to the maintenance of equipment, to see that employees have ample opportunity for rest and are fit to resume duty, and to make sure that the highest possible spirit of discipline and training is maintained among their employees. It is only by continually emphasizing these factors that the occurrence of accidents of this character, or other accidents at various points en route, can be prevented, or at least reduced to a minimum.

"The railroad employees involved were experienced men, and at the time of the accident none of them had been on duty in violation of any of the provisions of the hours of service law."

Pennsylvania Truckers Fined by Commission

Two pay $500 each for operating without certificate—Later receive permits

Two independent Pennsylvania motor truck lines were recently fined $500 each by the Public Service Commission of that State for operating without certificates of public convenience and necessity. At the same time the lines involved were granted limited franchises for through highway freight service between several points in the anthracite region and Philadelphia.

The fine, according to reports, was the result of complaints which had been made by six railroads against Chester T. Davies, Inc., and Arnold M. Blackmore, the latter operating as the A. Blackmore Transportation Company. Davies operates between Scranton and Philadelphia with branches between Scranton and Nanticoke, while Blackmore operates from Wilkes-Barre to Scranton and Philadelphia. The Commission found that both carriers began business as contract haulers and then extended their business to pick up and deliver without contract. In granting the permission to continue, the Commission held that present patrons of the two lines required the service. It restricted the franchises as to the commodities to be hauled, permitting only silk, meats and automotive accessories to be hauled by both and, in the Blackmore case, bakery products in addition.

Summer Meeting and Silver Anniversary of the S. A. E.

The Society of Automotive Engineers held its 1930 Summer meeting at French Lick Springs, Indiana on May 25 to 29. As this year marks the 25th anniversary of the founding of the Society, a special program, consisting of a historical pageant, was arranged in addition to the technical sessions.

Officers for 1931 were nominated, headed by Vincent Bendix for president. Other candidates selected by the committee are: C. W. Spicer, treasurer; Frederick S. Dusenberg, Norman G. Shidle, Charles E. Tilston, councilors. Vice-presidential nominees of the various divisions are: Dr. G. W. Lewis, aircraft engineering; Arthur Nutt, aircraft engine engineering; W. F. Joachim, Diesel engine engineering; John A. C. Warner and Carl B. Parsons, passenger car engineering; F. K. Glynn, transportation and maintenance engineering; A. K. Brumbaugh, production engineering. The papers, presented at twelve technical and two general sessions, included three on transportation and maintenance subjects, entitled "The Effect of Low Pressure Tires on Axle Design," by Mr. L. R. Buckendale of the Timken-Detroit Axle Company; "Analyzing Speed and Ability Factors of Motor Coaches and Motor Trucks," by Mr. A. J. Scaife of the White Motor Company, and "Self Maintenance as Compared with Service Station Maintenance," by Mr. H. V. Middeworth of the Consolidated Gas Company, of New York.

The historical exhibit was the center of great interest. The United States National Museum exhibited a group of office models illustrating the steps in the development of the internal combustion engine from about 1844 to the beginning of the present century. The model of the George Selden road carriage was also displayed with the specifications of the original patent. Various early models of automobiles were exhibited by the manufacturers, including a 1902 Peerless touring car with rear entrance, the famous "999" Ford racer, a 1905 White steamer, and a 1902 Franklin air-cooled car. The Public Service Co-ordinated Transport displayed a Diesel-engined, electric-drive motor coach.

Regularly Operated Texas Truck Lines Subject to Commission

The Railroad Commission of Texas in a recent order has designated as "Class A" carriers those motor truck lines which haul cotton and other commodities on no fixed schedule, but who follow generally the same route in repeated trips. This designation requires such carriers to submit their rate schedules to the commission for approval.

Alton Motor Coach Services Resumed After Suspension

The Alton Transportation Company, subsidiary of the Chicago & Alton, which recently discontinued motor coach operation, resumed operation on June 2. It is understood that the company will expand its motor coach routes in Illinois and Missouri as rapidly as operating certificates can be obtained.

St. Louis-Memphis Operations Inaugurated by the Cotton Belt

The Southwestern Transportation Company, subsidiary of the Cotton Belt, on June 1 began the operation of a fleet of 35-passenger motor coaches between St. Louis, Mo., and Memphis, Tenn. Two round trips daily are being operated, motor coaches leaving St. Louis at 8 a.m. and 8 p.m., and arriving at Memphis at 7:40 p.m. and 7 a.m., respectively.

Omaha Affiliate Granted Truck Line Certificate in Minnesota

The Wilson Transportation Company, highway freight line affiliated with the Chicago, St. Paul, Minneapolis & Omaha, was recently granted permission by the Minnesota Railroad and Warehouse Commission to operate a motor truck line for intrastate business between Ihlen and Jasper, Minn., and for interstate business between Sioux Falls, S. Dak., and Pipestone, and Luverne, Minn.

The Wilson Transportation Company, as pointed out in the *Motor Transport Section* of February 22, page 504, already operates an extensive trucking service in South Dakota in co-ordination with rail service of the Omaha.

Independent Lines Join With Interstate Transit

Union Pacific subsidiary absorbs number of additional small companies

The consolidation of a number of independent motor coach lines with the Interstate Transit Lines and the Union Pacific Stages, subsidiaries of the Union Pacific, has been announced by officers of the railway. The lines merged with the motor coach system of the Union Pacific include the Bee Hive Stages of Salt Lake City, Utah, the Gem State Transit Company of Boise, Idaho, the W. A. O'Neil Line of Boise, Idaho, the Mumford & Brown Line of Grangeville, Idaho, and the Ogden-Coalville Stage Line of Ogden, Utah.

The Bee Hive Stages operate eight motor coaches from Pocatello, Idaho, to West Yellowstone, Mont., and from Pocatello to Montpelier, Idaho. The Gem State Transit Company operates four motor coaches from Boise to Caldwell, Idaho. The O'Neil line operates two motor coaches between Boise and Payette Lakes, and between Caldwell and Emmett, Idaho. The Mumford & Brown line operates three motor coaches between Weiser, Idaho, and Grangeville, while the Ogden-Coalville Stage Line operates one motor coach between Ogden and Coalville.

The motor coach operating system of the Interstate Transit Lines and Union Pacific Stages now covers 8,307 miles of routes, has 350 motor coaches in daily operation, and serves nearly 1,000 stations. The principal trunk lines of the system extend from Chicago to Omaha, Cheyenne and Ogden, and southwest to Salt Lake City and to Los Angeles, and northwest from Ogden to Portland, Ore., and Seattle, Wash. Another begins at St. Louis, Mo., and runs west through Kansas City to Denver, Colo. There are connecting lines from Kansas City to Omaha and from Denver to Cheyenne. Another trunk line extends northwestward from Omaha to Sioux Falls, S. D., and another from Omaha to Minneapolis and St. Paul. There are also lines from Boise, Idaho, to Spokane, Wash., and from Spokane to Portland.

The company has recently opened a new motor coach station in Minneapolis, Minn., and will shortly begin the construction of a large modern station at Topeka, Kan.

Milwaukee Would Substitute Coaches for Montana Trains

The Chicago, Milwaukee, St. Paul & Pacific has applied to the Montana Railroad Commission for permission to substitute motor coach service for local trains operating between Lewistown, Mont., and Harlowton. The amount of traffic available does not justify the operation of trains, according to the Milwaukee. The motor coaches will carry mail and express as well as the passengers.

Traffic Managers Hold Meeting at San Antonio

National Association formed at closing session of third general conference

Traffic managers of motor coach lines in various parts of the United States held their third general conference at San Antonio, Tex., on May 20 and 21, and at the closing session formed the National Association of Motor Coach Traffic Managers. Officers of the association are M. S. Wren, general traffic manager, Southland Greyhound Lines, president; Joe C. Carrington, secretary-manager of the Texas Bus Owners' Association, secretary-treasurer.

Round table discussion resulted in agreements on the handling of baggage on inter-line tickets, and on charges to be made for excess baggage and packages. The report of the committee on the multiple coupon tickets for inter-line travel was adopted by the meeting, the new rule being that coupons must be attached to the ticket showing the definite routing over each line. The report of this committee was presented by P. J. Neff, vice-president and general manager of the Missouri Pacific Transportation Company, who is chairman of the committee. This form of ticket, according to Mr. Neff, will help to stabilize the motor coach business, and will give passengers definite information as to necessary changes en route, stop-over privileges, etc. Other matters discussed at the meeting had to do with reclaims on tickets and more simplified methods of accounting.

Lon A. Smith of Austin, Tex., a member of the Texas Railroad Commission, was the principal speaker at a banquet tendered the delegates.

Pickwick Corporation Reports 1929 Net Income of $778,969

Net earnings of $778,969 after all charges, including Federal income tax reserves, were reported by the Pickwick Corporation for the year ending December 31, 1929, according to the annual statement recently made public by Charles F. Wren, president. The foregoing figure represents an increase of 50 per cent over the 1928 net earnings of $514,589 and is equivalent, after preferred dividends, to $1.02 a share on the average amount of common stock outstanding during the past year.

Gross revenue for the year amounted to $2,417,850, comprised of $1,331,040 in revenues from sales of manufactured products, parts and other commodities: $474,143 in revenues from terminal operations and $612,667 from dividends, interest and miscellaneous income. Expenses totaled $1,397,864 including general and administrative expenses of $173,719; cost of manufactured products and parts sold, $945,027, and other expenses $279,117. This left a gross operating income of $1,019,986.

"This statement," Mr. Wren pointed out, "includes only profits derived from stock interest in affiliated motor transportation companies in the form of cash dividends, and does not include surplus earnings in excess of such dividends. Pickwick Corporation's growing system of depots, hotels and other terminal facilities all are leased under favorable terms for a long period of years. The Corporation now owns substantial interests in several of the larger motor transportation lines throughout the United States. Its principal co-shareholders in these lines are the Greyhound Corporation of Chicago and the Southern Pacific Company. Present indications point to an even more successful year in 1930 than in 1929."

Permit to Substitute Coaches for Trains Sought by L. A. & S. L.

The Los Angeles & Salt Lake has applied to the California Railroad Commission for authority to discontinue passenger train service between Los Angeles, Cal., and San Pedro. The company proposes to operate motor vehicles in substitution for the rail service.

Northland Owns 175 Vehicles; Daily Coach Mileage 30,000

With the purchase of 35 new motor coaches, the Northland Greyhound Lines now has 175 cars in its fleet. The new equipment is being placed in service over the various lines of the company in Minnesota, Wisconsin and Illinois. The Northland Greyhound Lines are now operating 30,000 motor coach miles daily.

Mississippi Motor Coaches Not Subject to County Boards

The contention that boards of supervisors of counties in the state of Mississippi through which motor coaches pass have jurisdiction over the motor coach lines, has been denied by the supreme court of the state. Jurisdiction over the motor coach lines in Mississippi has been previously, and will presumably continue to be, administered by the Mississippi Railroad Commission.

N. C. Operators Are Complying With Race Segregation Order

Motor coach lines operating in North Carolina are complying with the recent decision of the State's Supreme Court requiring them to provide separate accommodations for negro passengers, according to a recent statement of R. O. Self, director of Motor Vehicle Transportation with the North Carolina Corporation Commission.

In most of the larger cities, Mr. Self pointed out, separate accommodations have been provided in waiting rooms and the same development is taking place in the smaller communities. No change has been made on the motor coaches since negro passengers have always been accommodated on them, the statement said; they occupy the rear seats as they do on the trolley cars. Thus the only change brought about by the decision was the provision of separate waiting and wash rooms.

P. R. R. Trucking Plan Rejected in Maryland

Commission refuses permits for store-door service by railroad affiliates

The Public Service Commission of Maryland on June 15 denied the application of two trucking companies, affiliated with the Pennsylvania which sought to establish extensive motor truck services affording store-door delivery to communities along the Maryland eastern shore.

In rendering this decision, the Commission stated that it felt the territory was adequately served by existing highway freight lines. At the same time however, it approved the application of six other companies, some of which sought routes overlapping those proposed in the railroad's plan.

The companies whose applications were refused are the Baltimore Transfer Company and the Peninsula Auto Express Company. They planned to link eastern shore communities as far south as Cape Charles, with a co-ordinated railway and store-door delivery service. This service, the Commission felt, was "not required by the public welfare or convenience" and added that an unusual number of protests against the plan had been received from several of the communities along the eastern shore.

The applications granted were those of J. Norman Marshall, Alexander H. Stewart, Cummings & Tyler, H. B. Watson, Ogle Z. Jones and the Victor Lynn Transportation Company. The plan of the latter covered five routes which are: Salisbury to Ocean City; between Salisbury, Hurlock, Federalsburg and Preston; between Westover Junction, Crisfield and Lawsonia; from Berlin to the Delaware State line and between Berlin, Ironshire and Newark.

Previous reports on the case indicated that considerable opposition to the Pennsylvania plan was stimulated among the chambers of commerce of the communities to be served.

Also it was pointed out that existing trucking companies in the territory urged the denial of the application on the ground that present service was entirely satisfactory and that the advent of new services such as those proposed would drive independent trucking companies out of business.

Joplin-Hollister, Mo., Permit Granted Missouri Pacific

A permit to operate motor coaches between Joplin, Mo., and Hollister has been granted to the Missouri Pacific Transportation Company by the Missouri Public Service Commission. The transportation company is restricted from transporting passengers between Joplin and Sarcoxie since other motor coach lines already in existence are furnishing adequate service in that territory, according to the statement issued by the commission.

Texas Highway Companies Taxable Only Where Main Office Is Located

Attorney General so rules when McLennan county officials ask concerning authority to tax vehicles of Southwestern Transportation Company

Attorney General Robert Lee Bobbitt of Texas in a recent ruling held that motor vehicles owned by motor coach and truck lines in that State are subject to personal property taxes only in the county in which the company has its principal office, even though the vehicles are being operated through other counties. The opinion was delivered in response to a request from McLennan County officials asking if that county had authority to tax motor vehicles of the Southwestern Transportation Company, highway subsidiary of the St. Louis Southwestern. The full text of the opinion, as reported in a recent issue of the United States Daily, follows:

"This department acknowledges receipt of your letter of the 22 ultimo in which you ask to be advised if McLennan County has authority to tax the motor vehicles which constitute the rolling stock of the Southwestern Transportation Company in its operations over the route between Waco in McLennan County and Tyler in Smith County. You state that this company is a foreign corporation and that its principal office in Texas is at Texarkana, Bowie County, that it owns a number of certifications of convenience and necessity issued by the railroad commission authorizing the operation of both motor coach and truck lines as common carriers; that one of the lines operated by this company is between Waco and Tyler; that it has other routes over which it operates, such as from Texarkana to Dallas, and from Commerce to Sherman; that all of these routes are divided into separate operations; that in operating the route from Waco to Tyler the schedules are such that some of the trucks and motor coaches are kept over night at Waco, some at Tyler; and some at Corsicana; that the particular coaches or trucks operated over this route are never sent to Texarkana unless for the purpose of being overhauled or to change the same permanently to some other line; that temporary repairs are made at Tyler.

"Article 8, section 11, of the constitution of Texas reads as follows:

"All property, whether owned by persons or corporations, shall be assessed for taxation and the taxes paid in the county where situated.

"Article 7153 of the Revised Civil Statutes for 1925 provides:

"All property * * * shall be listed and assessed in the county where it is situated; and all personal property subject to taxation and temporarily removed from the State or county, shall be listed and assessed in the county of the residence of the owner thereof, or in the county where the principal office of such owner is situated."

It is well established that under the common law, personal property of every kind is taxable only at the domicile of its owner, regardless of its actual location. See Great Southern Life Ins. Co. v. City of Austin, 112 Tex. 1; 243 S. W. 778; 26 R. C. L. 273.

"In the case of Great Southern Life Insurance Company v. City of Austin, supra, the court construed the above provisions of the constitution and statutes, and held that the phrase "where situated" means where situated for the purpose of taxation under the common law as then understood or as defined by statute, while holding to the general rule that under the common law all personal property is subject to taxation at the domicile of the owner, yet the court uses this language:

"'But even prior to the Revolution the principle had been abrogated to the extent that as between different towns and taxing districts, certain classes of tangible personal property had a taxable situs where employed in business, regardless of the domicile of its owner.'"

See also Galveston v. Guffey Petroleum Co., 113 S. W. 585 (writ of error denied); 26 R. C. L. 276.

"We conclude, therefore, that tangible personal property can have a taxable situs in a county other than the residence of the owner. The question to determine, then, is whether the rolling stock of the company mentioned by you has acquired a fixed situs in McLennan County.

"The motor transportation business is new and we are unable to find any court decisions with reference to the situs of the rolling stock for the purpose of taxation. However, we do believe that there is a great similarity between the taxation of rolling stock of railroads and that of motor transportation companies.

"As to the situs for taxation of rolling stock of railroads, the question is well settled by article 8, section 8, of the constitution of Texas, and article 7169 of the Revised Civil Statutes, which provide for apportioning the value to the various counties through which the railroad operates. We have no statute pertaining to the method of taxing the rolling stock of motor transportation companies, and, therefore, we believe that the law applicable to the taxation of rolling stock of railroads will apply to the rolling stock of motor transportation companies.

"Many other States of the Union provide the same method as Texas for taxing the rolling stock of railroads. It seems well settled that where no special provision has been made by law for the taxation of rolling stock of a railroad, the situs for taxation of same is the city in which the railroad company's principal office is located. See 26 R. C. L. 230; Board of Supervisors v. City of Newport News, 106 Va. 764; 56 S. E. 801; United Tank Line Co. v. Day, 79 So. 334 (La.); A. C. L. R. Co. v. Amos, 115 So. 315 (Fla.).

"In the case of C. C. & S. F. Ry. Co. v. City of Dallas, 16 S. W. (2d) 292, the commission of appeals discusses the law in Texas with reference to the taxation of rolling stock of a railroad and held that even though it was shown some switch engines of a railroad had a fixed situs other than the county of the principal office of the railroad, yet the same was taxable only in the county of the principal office. This opinion, however, was based upon the view that the laws of Texas had determined the manner of taxing all rolling stock of railroads by apportionment to the various counties. However, the common law rule with reference to the taxation of personal property was fully recognized and quotation was made from the case of Great Southern Life Insurance Co. v. City of Austin, supra.

"But regardless of whether we should adopt the rule that rolling stock of motor transportation companies is taxable only at the principal office of the owner, we fail to see wherein the rolling stock mentioned by you has acquired a taxable situs in McLennan County. You state that the route is operated daily, both as to trucks and motor coaches, and that the schedules are such that some of the trucks and motor coaches are kept at night at Waco, some at Tyler, and some at Corsicana.

"In operating the route described by you, the motor coaches and trucks operate over the highways in five counties, to-wit: McLennan, Hill, Navarro, Henderson and Smith. Why should these motor coaches and trucks, under the circumstances, be taxed in McLennan County any more than in Hill, Navarro, Henderson, or Smith County, or in either of said counties any more than in McLennan County? The

Truck Line Gets Permit When Rail Rates Increase

Because business had been diverted to South Dakota points as a result of a recent decision of the Interstate Commerce Commission increasing certain railroad freight rates in the territory involved, the Minnesota Railroad and Warehouse Commission recently granted the Cammack Freight Line a certificate for the operation of motor trucks between Lake Benton and Mankato. The route is approximately 173 miles in length and the franchise permits the Cammack Freight Line to serve all intermediate points.

The Commission held that with the establishment of the truck line a large volume of the business which it found to have been diverted by high freight rates to South Dakota will be recovered by Minnesota jobbers.

situs is in one county as much as in any other county.

"But as a matter of fact, no taxable situs has been acquired in either of said counties. Therefore, we must resort to the common law rule that personal property is taxed at the domicile of the owner, for, in the particular case, it occurs to us that the rolling stock is no more than temporarily situated in McLennan County, and under article 7153 is taxable in the county of the residence of the owner, to-wit, Bowie County.

"Since the only authorities we have been able to find indicate that the rolling stock is taxable only at the principal place of business of the corporation, since no showing has been made that the property has a fixed status in McLennan County, and since the legislature has not enacted a law fixing the situs of such property for taxation, you are advised that, in our opinion, the rolling stock mentioned by you is not subject to taxation in McLennan County."

Extent of P. R. R.'s Trucking Services Shown in Recent Book

The extent of the line haul trucking service operated by the Pennsylvania is indicated in tables published in a recent book entitled "Coordinated Motor-Rail-Steamship Transportation" by G. Lloyd Wilson, professor of commerce and transportation, University of Pennsylvania. In connection with his chapter entitled "Rail-Motor Line-Haul Coordinated Freight Service," Mr. Wilson publishes a tabulation of these truck routes as supplied by the office of the Pennsylvania's general superintendent of stations, transfers and motor service.

While the tabulation is as of October 3, 1928, and thus several routes have no doubt been added since the material was compiled, the figures nevertheless indicate the great amount of trucking being conducted by the Pennsylvania.

For the Eastern region there are listed 21 routes, operating 34 motor trucks, 848.5 route miles and serving 364 stations. The first of these routes was established in January, 1923, and extends from Salisbury, Md. to Cambridge, Md., 92.5; this when the table was compiled remained the longest route in operation. The next longest is the 79-mile line between Walnut St., Philadelphia and Whitings, N. J. The Salisbury-Cambridge route, however, serves but 12 stations, whereas the Philadelphia-Whitings route serves 30, the largest number on any of the lines listed. Other long routes in the Eastern region are: The 60-mile line serving 24 stations between Trenton and Linden, N. J., and the 52-mile route serving 28 stations between Perth Amboy and Seaside Park, N. J., and the 51-mile route serving 15 stations between Trenton and Phillipsburg, N. J. The second largest number of stations served, however, is on a 34-mile run between Walnut St., Philadelphia, and West Chester, Pa.; this serves 29 points.

Of the 34 trucks in service at the time on the eastern routes, 28 were of 5-ton capacity, three of 3½-ton capacity, one of 2½-ton, and two of 2-ton.

House Bill Would Permit Highway Carriage of Mail

A bill which would permit railroad and electric car lines to transport mail in motor vehicles in lieu of transportation by trains, has been reported in the House of Representatives by the Committee on Post Offices and Post Roads.

"The measure is made necessary on account of changes in transportation facilities," the report explains. "Many mail trains are being taken off regular schedule by the railroad companies and it becomes necessary to provide for other means of transporting the mails. Under the present law the railroads carry the mail at rates established by the Interstate Commerce Commission."

The report further explains that "under the provisions of this measure the Postmaster General is authorized to permit railroad and electric car companies to carry the mail by motor vehicle over highways in lieu of their train service, and the compensation allowed shall not be in excess of the rate paid for train service as fixed by the Interstate Commerce Commission. It is essential that such action be taken if adequate postal service at reasonable cost is to be assured patrons in many communities."

In the Central region there are listed 18 routes over which are operated 21 trucks serving 242 stations. The route mileage in this region is 689, so that the grand totals for the two regions listed are: 39 routes, 1,537.5 route miles, 606 stations served and 55 trucks operated.

The largest route in the Central region operates out of Greensburg along the Sewickley, Hempfield and Youghiogheny branches of the Pennsylvania. It is 76 miles and serves 14 stations. Other long routes in this region are: The 62-mile run serving 16 stations, between Pittsburgh and Elrama, Pa. and the 60-mile line serving 19 stations between W. Brownsville and Dunbar and Newcomer. Of the 21 trucks in service at the time in this Central region, 18 were of 5-ton capacity and three of 3½-ton capacity.

Minnesota Rules on Liability on Trucking Company Sureties

When an automobile transportation company in Minnesota fails to remit to a shipper funds collected by it upon delivery of shipments, the surety on its statutory bond may be held liable in a suit brought by the shipper even though the bond runs to the State as obligee, John F. Bonner, assistant attorney general, held May 13 in an opinion rendered to the State railroad and warehouse commission.

The condition of the bond is for the benefit of the shipper, Mr. Bonner ruled, and the real party in interest should sue upon it.

His opinion follows, as reported in a recent issue of the United States Daily:

Gentlemen: You submit form of bond drawn pursuant to the provisions of section 11, chapter 185, laws 1925, relating to auto transportation companies and state:

"A truck company has collected and received moneys for a shipper on C. O. D. shipments. Several shipments are involved, running in amounts from $8 to $115. The company has become insolvent with no assets to pay claims. If shipper claimants obtain judgment against such insolvent truck company is such judgment creditor secured by this bond?"

I answer this question in the affirmative.

This bond runs to the State of Minnesota. The pertinent portion of the obligation is as follows:

Now therefore, if said above bounden principal shall faithfully discharge all duties as a common carrier of persons and / or property for hire over all highways of the State of Minnesota, for which any certificate of public convenience and necessity is or may be granted or issued to said applicant, pursuant to the provisions of chapter 185, Laws of 1925, and acts amendatory thereof and supplementary thereto * * * then this obligation shall be void; otherwise to remain in full force and effect.

One of the duties of a common carrier of persons or property for hire is to promptly pay over to the shipper moneys collected by such carrier on C. O. D. shipments. A violation of this duty constitutes a breach of the condition of the bond.

It remains then to consider whether, the bond running to the State, a shipper injured by a breach of the conditions can sue the surety thereon. The condition of the bond which we have heretofore quoted is plainly for the benefit of the shipper. He is the real party in interest.

Section 9165, Mason's Minnesota Statutes 1927, requires every action to be prosecuted in the name of the real party in interest. Under this section it has been held that a bank could sue the surety on a breach of the conditions of a bond given to A. J. Veigel as State superintendent of banks.

Harriet State Bank v. Samels, 164 Minn. 265, where on page 269 the court says: "Although the bond ran to Mr. Veigel the bank was the party really interested—hence it had a right to sue. G. S. 1923, section 9165; 20 R. C. L. 665."

In Moede v. Haines, 66 Minn. 419, it was held that in proceedings to contest an election in which a bond was executed, approved and filed, conditioned that the contestant "will pay the cost and expense of such examination and inspection [of the ballots] in the event that he shall fail to maintain his contest," where the contestee was named as obligee, upon the breach of such conditions an action could be maintained by each of the persons to whom the examination and inspection of the ballots was referred in his own name. The court says:

"The bond provided by the terms of section 193 is wholly statutory, and is given for the protection and benefit of,

the persons to whom the examination and inspection of the ballots is referred. No one else is interested, and, as the real parties in interest, the inspectors should have the right to maintain the action, precisely as if no obligee had been named, or the obligation had run to the State."

See also Michaud v. Erickson, 108 Minn. 356. This case seems to be in accord with the general rule as stated in 9 C. J., Bonds, page 86, section 152, as follows:

Under statutes, in many jurisdictions, which prescribe that the real party in interest must be the plaintiff, the obligee need not sue if he is not entitled to the beneficial interest in the bond; but the party for whose benefit the bond is executed, whether the obligee or some other person, must sue thereon.

$3,000,000 Coach Order of Railway Affiliates

(*Continued from page 1542*)

gon; the remaining 25 will be delivered within the present month and are to be placed in service in California.

Fifty of the 110 coaches ordered from General Motors have been delivered, 30 being placed in service on the west coast routes while 20 were delivered in Denver for service on Pickwick Greyhound Lines between there and Salt Lake City, Utah, and Gallup, N. M. The 60 remaining motor coaches of this order are scheduled for early delivery and will be used in the Denver-Chicago service of the Pickwick Greyhound Lines.

In addition to the foregoing, six new Pickwick 53-passenger Duplex motor coaches are soon to be placed in service on Pickwick Greyhound Lines between Los Angeles and Salt Lake City. Other Duplex coaches included in the order will be placed in operation in California.

In commenting on this large order the statement said, "The new coaches are mostly of the 36-passenger type and represent the last word in modern highway travel comfort. All have reclining arm chairs upholstered in velour, with overhead baggage racks and interior luggage compartments. They are steam heated and have forced ventilating system, and are equipped with four-wheel air brakes, safety glass, emergency doors and other safety features. Extra wide spacing between seats adds much to passenger comfort. The coaches were specially built to our specifications and incorporate many features which represent a distinct improvement over stock model coaches."

Orders for Equipment

THE UNION PACIFIC STAGES has received 11 type 250 Yellow coaches of the observation type.

THE FORT DODGE, DES MOINES & SOUTHERN TRANSPORTATION COMPANY has accepted delivery of two type 250 33-passenger Yellow coaches of the observation parlor type, and two type U 21-passenger Yellow coaches of the observation type.

THE CANADIAN GREYHOUND COACHES, INC., has received two type Y 29-passenger parlor type Yellow coaches.

THE EASTERN GREYHOUND LINES have taken delivery of 20 type 250 33-passenger observation parlor type Yellow coaches.

THE CANADIAN YELLOWAY LINES have received 6 type Y 29-passenger parlor coaches from the General Motors Truck Company.

THE NORTHLAND-GREYHOUND LINES have taken delivery of 10 type 250 33-passenger Yellow coaches of the observation parlor type.

THE PEOPLE'S RAPID TRANSIT COMPANY has received 10 type 250 33-passenger observation parlor coaches from the General Motors Truck Company.

THE PACIFIC GREYHOUND LINES have accepted delivery of 29 type 250 33-passenger Yellow coaches of the observation parlor type.

THE PICKWICK GREYHOUND LINES have accepted delivery of 30 type 250 33-passenger observation parlor coaches from the General Motors Truck Company.

Pacific Greyhound Lines Reduce Fares for Summer

Special reduced summer excursion rates were placed in effect by the Pacific Greyhound Lines on May 20, according to an announcement of E. S. Sullivan, general agent. The new tariffs are effective throughout the Pacific coast territory and apply from Los Angeles and Long Beach to San Francisco, Portland and Seattle. They offer a choice of the coast or inland routes to San Francisco and Pacific or Redwood highways north from there.

The reduction also applies to the Pickwick "Nite-Coaches" operating between Los Angeles and San Francisco.

Among the Manufacturers

J. L. Sydnor, district manager for the **White Company** at Los Angeles, Cal., has been promoted to regional manager of the Pacific coast, with headquarters at San Francisco, Cal., and **Rolla W. Moore,** manager at Portland, Ore., has been appointed to succeed Mr. Sydnor as district manager at Los Angeles. **Ralph Guthridge,** salesman at Los Angeles, has been promoted to manager at Portland. Mr. Sydnor will have jurisdiction over all district and branch offices of the White Company in the Pacific coast territory. He has been connected with the company for 13 years,

J. L. Sydnor

having served at the home office in Cleveland and as district manager at Salt Lake City, San Francisco and Los Angeles.

S. Johnson, Jr., has been appointed chief engineer of the recently-formed **Bendix-Westinghouse Automotive Air Brake Company,** with headquarters at Pittsburgh, Pa. Mr. Johnson was graduated from the University of Michigan with the degree of mechanical engineer and came to Pittsburgh in July, 1929, as general engineer for the automotive division of the Westinghouse Air Brake

S. Johnson, Jr.

Company, which recently joined with the Bendix Aviation Corporation in the formation of the Bendix-Westinghouse Automotive Air Brake Company. Previous to July of last year, he served successively in the capacity of inspector, mechanical expert, assistant district engineer and service engineer over a period of six years with the Automotive Brake division of Westinghouse at Chicago.

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Facing the Future

PRESIDENT AISHTON of the American Railway Association very truly said in his address to the Purchases and Stores division on Wednesday that the prevailing business depression is much less important to the railways than the question as to what railway traffic will be when business becomes normal again.

The reason why this is true is, of course, that passenger business has declined one-third during the last decade and that freight business has increased relatively much less rapidly than it did before the war. Mr. Aishton did not make the remark referred to in a pessimistic spirit, but for the purpose of emphasizing that railway officers in dealing with present conditions should keep their eyes fixed on the future. Railway managements are engaged in a great struggle, first, to protect traffic from diversion to other means of transportation and, second, to effect improvements in service and economies in operation which will enable them to earn a reasonable amount of net return in handling whatever traffic may be available when general business improves.

The economies made in operation within recent years represent an achievement hardly second to the improvement made in service. It is quite plain, however, that if the railways are going to earn in the future an adequate net return, they must continue the campaign for economies even more successfully than they have in the past. A period of depression is always a good time to find the means by which, and the place at which, savings can be made. There is a great deal of difference between reductions in operating expense secured by curtailing maintenance, and reductions secured by capital investment and improved methods that do not involve physical deterioration of properties. The greatest real savings are accomplished by the development and use of improvements in railway plants that reduce the amount of labor, materials and fuel required for the production of a given amount of transportation.

The co-operation between railway officers and the railway equipment and supply manufacturing industry which results in such improvements in plants is no where better exemplified than in the holding of the railway conventions and the manufacturers' exhibit in connection with each other at Atlantic City. To keep the railway industry in a sound condition, physically and financially, is going to require tremendous efforts, but the spirit shown here this year is the best evidence that the struggle will be carried on successfully.

The Arch Bar Truck Passes

THE arch-bar truck served American railroads well, but its day of effective usefulness passed and it has now been definitely relegated to the scrap heap by the action of the Mechanical Division at its Thursday meeting. The recommendation of the Arbitration Committee that "on and after January 1, 1936, no car will be accepted in interchange equipped with arch bar trucks" was formally approved by the Division, with the expressed understanding, however, that the date would be extended if necessary to avoid working a hardship on any roads. The use of the American Railway Association standard arch-bar section in repairs was made optional in order to avoid the waste involved in strengthening trucks which will be retired in any event within a five-year period.

All of the familiar arguments against putting a definite limit on the service of the arch-bar truck were advanced during the discussion of the Arbitration Committee's report, the principal one being that the cost would be prohibitive. One railroad estimated a cost of about five million dollars by the end of the five-year period. Another set the cost at ten million dollars and said that no means of financing this extensive improvement program, however desirable, was immediately apparent. Considerable of the discussion was designed to show that the arch-bar truck did not contribute substantially to accidents and train delays, but the general opinion was to the effect that, considering both the direct and the indirect costs, the thousands of arch-bar trucks now in service on American roads represent a serious drain on railroad earnings.

On this point there can be no real argument. The records of the Bureau of Safety show many cases of serious accident resulting from the failure of arch bar trucks. Individual roads know how much these failures

are costing them. One representative of a prominent mid-western carrier testified that when a thorough dismantling and inspection of arch bar trucks, accompanied by annealing, is carried out, as many as 20 per cent of the arch bars inspected will be found fractured and potentially dangerous. He said that the additional inspection and maintenance expense, coupled with the cost of setting out cars and the interruption of train service owing to arch-bar trucks, has cost his road $158,000 during the period of a year ending May, 1930. If additional testimony were needed, it is afforded by the tabulation of defects presented in Mr. Kleine's paper Thursday morning. This paper, which described results of the inspection of freight cars over a 64-day period at the Altoona, Pa., inspection pit of the Pennsylvania, showed 102 cracked arch bars which were potential accident producers, this being an average of almost two a day.

Most of the objections to the proposed legislation with regard to the arch bar truck centered around the misapprehension that the date, January 1, 1936, for the retirement of all arch bar trucks was fixed. The American Railway Association, through its Mechanical Division, has never in the past set up a hard and fast rule which will work a hardship on the railroads, and it may be accepted as a certainty that in this case, also, such extensions of the effective date of this rule as may be necessary in the best interests of the railroads as a whole will be made. In view of the demand for heavier loading, faster train speeds, more intensive use of equipment and reduced maintenance costs, all of which factors are adversely affected by the arch-bar truck, the Mechanical Division is to be congratulated on its action at Thursday's session in setting a definite date as a goal for its efforts in replacing this type of truck.

Trends in Passenger Coach Design

THE Passenger car exhibit this year, though small and largely confined to day coaches, is, however, sufficient to indicate some of the tendencies which have been noticeable in new equipment recently placed in service on a considerable number of roads. Designers of railroad passenger cars and those responsible for securing passenger traffic have usually been guided to a large extent by the supposed desires and tastes of the traveling public. In general, the interior finish and the appointment of passenger cars have fairly well reflected the wishes of the people using such equipment. When ornateness began to be recognized as bad taste, simplicity and quietness of finish and color became the vogue. As better lighting and improved toilet facilities became more general in the home a similar trend was again reflected in passenger cars.

These changes were applied first on special limited equipment but more recently have been noticed in ordinary day coaches. Only a few years ago the passenger-coach designer apparently gaged the success of his design by the number of passengers that could be seated in a coach of a given length. Seats were spaced too close for comfort and for commuting service provision was made for seating two passengers on one side of the aisle and three on the opposite side. This arrangement, however, never became very popular, even though accepted with little protest where runs were short and traffic rather dense.

An entirely different set of ideas evidently guided the designers of the passenger coaches exhibited at the present convention. As an example, one of the day coaches shown has provision for the seating of only 39 passengers in the main room, while at either end there are smoking or retiring rooms for men and women with toilet facilities which were never provided a few years ago in any day coach. Single or double individual seats, revolving or movable, are being increasingly used. In some cases individually controlled window ventilators are provided. Consideration also is being given to a reduction in noises by the use of rubber cushion seats for springs, equalizers and other truck parts. Thus, many improvements are being noted from year to year. A more extended attention to the details referred to should provide an increased comfort and satisfaction in travel by rail which is not available in other means of land travel and should help in holding and regaining railroad passenger traffic.

The Most Successful Motor Transport Meeting

THE Motor Transport Division concluded yesterday the most successful meeting which it has ever held. Officers and members of the division, whose efforts during recent months made possible the presentation of a most interesting, timely and constructive program have reason to feel proud of the results of their work. No one, it is felt, who attended the sessions of the division could possibly have left them feeling that his time had been wasted. There has been wonder in the past at the apparent indifference of some railroads toward the work of the Motor Transport Division. There have been several reasons for this, but by putting on at its meetings programs of the excellent character of the one concluded yesterday, it is confidently believed that the Motor Transport Division will quickly win the enthusiastic support of all railways, and of many more railway officers than have attended its earlier meetings. The Motor Transport Division is doing a good job for the railways of the country.

Motor Car Power Plants

RECORDS of rail motor cars ordered during the past five years show a steady increase in the size of power plants used. In 1925, out of a total of 136 cars ordered, there were 13 having power plants of less than 100 horsepower and the largest were two rated at 350 horsepower. In 1926 there were eight ordered, having ratings of 400 horsepower or more, and 11 with ratings between 450 and 500 horsepower. In 1927 there were eight cars ordered, having power plants exceeding 500 horsepower. During 1929 there were 30 cars ordered having power plants rated at more than 500 horsepower, and only six new cars with power plants of 100 horsepower or less. Depending upon the service requirements, the cars are used singly or to haul

one, or in some cases a number of trailers. In one instance a motor car has been used to haul as many as eleven refrigerator cars. In the past, the larger plants have been made up in most cases of two engines.

This is undoubtedly justified under the circumstances, but it makes for increased complication where simplicity is important, and it is probably difficult under average operating conditions to be sure that each engine is doing its share of the work. The manufacturers, however, have proceeded with their designs to meet these requirements and there are now available and on exhibit at the convention single-unit plants of sufficient size to meet most of the demands.

Draft Gear Report an Outstanding Contribution

NOTWITHSTANDING the inclusion of a number of reports of exceptional merit in this year's program of the Mechanical Division, the opinion is expressed on all sides that the report of the Committee on Couplers and Draft Gears, presented on Friday, constitutes an outstanding contribution to the achievements of the division. Much interest centered in that part of the report devoted to the new Type E coupler design which promises to demonstrate important advantages over the familiar Type D coupler which has for years been standard in American railroad practice. This part of the report, illustrated by comparative lantern slides, was unanimously adopted with a rising vote of thanks, both to the committee and to the manufacturers who co-operated whole heartedly in meeting the problems presented in the development of the new design.

It is safe to say, however, that even greater interest was displayed in the report of the sub-committee on draft gears which was divided essentially into three recommendations for submission to letter ballot: namely, specifications for approved draft gears for freight service; a certificate of approval for draft gears which meet these specifications, and purchase specifications which the railroads may use in satisfying themselves that any gears furnished are representative of the types approved.

The specifications referred to are really the result of three years' intensive effort on the part of the committee. They comprise a revision of the tentative specifications presented at the 1929 annual meeting in Los Angeles, Cal., and represent the best knowledge and experience of the individual committee members and of the draft gear manufacturers who have studied them carefully, offered constructive criticism and are practically unanimous in saying that they represent a forward step in the general effort to provide more efficient and satisfactory draft gears for railway service. Certain differences of opinion naturally still exist, notably regarding permissible recoil and the minimum gear capacity specified. The discussion on the floor of the convention, however, made it plain that the specifications, as generally approved by the railroads and the manufacturers, are not a final product, but represent the best specifications which can be written at the present time.

Probably few members of the Mechanical Division realize how much time and effort the Committee on Couplers and Draft Gears has put into its work this year, as summed up in the report. Monthly meetings with the engineering committee of the coupler manufacturers, for example, have been held, and every suggestion for improvement put into effect if practicable With the continued co-operation of coupler and draft gear manufacturers, as well as the railroads in the coming year, it seems probable that the next report of the committee will contribute as much to improved railway operation as this one promises to.

Today's and Sunday's Programs

TODAY, Saturday, could well be designated as Railway Supply Manufacturers' Day. There are no technical programs, thus leaving the time entirely free to visit and study the exhibits. In addition to the appliances shown on the upper and lower levels of the Exhibit Hall, there are track exhibits at both the Reading and the Pennsylvania (electric) terminals. Buses will leave for the track exhibits every 15 minutes during the day from the ocean side doorways of the lower exhibit in the Auditorium.

R. S. M. A. Meetings

Elections for representatives on the Executive Committee of the Railway Supply Manufacturers' Association for districts two, three, four, five, six and seven, will be held in Room 2 of the Auditorium between the hours of 10:00 and 10:30 a.m., daylight saving time.

The annual meeting of the Railway Supply Manufacturers' Association will be held in Room 12 of the Auditorium at 12 o'clock noon. In addition to annual reports and other matters of business which are to be transacted, the annual election of officers will be held.

Entertainment

10.30 A. M.—Orchestral Concert, Ball Room. William Klaiss, Feature Pipe Organist. Indoor Golf.

12.30 P. M.—Band Concert, Main Auditorium, Reading Co. Shop Band.

3.30 P. M.—Orchestral Concert, Ball Room. Impromptu Dancing. William Klaiss, Feature Pipe Organist. Indoor Golf.

9.00 P. M.—International Night, Ball Room. Informal Dancing.

Mae Mackie, Contralto, Philadelphia Civic Opera Company.
William Klaiss, Feature Pipe Organist.
The Four Melody Harmonists.
Marsara Sextet.
Special Features.

Sunday's Program

A Sacred Concert will be held in the ballroom of the Auditorium at 3:30 o'clock, Sunday afternoon. Music will be furnished by the Pennsylvania Railroad Altoona Works Male Chorus, by the Reading Company Shop Band, and William Klaiss, feature pipe organist.

Lost

Badge No. 4982, Mrs. L. H. Crawford. Finder please return to owner, at the booth of the Standard Car Truck Company, spaces 316 and 399, or to the Enrollment Booth.

R. S. M. A. Nominations

THE nominating committee of the Railway Supply Manufacturers' Association has made its report, nominating S. G. Down of the Westinghouse Air Brake Company as president, and D. L. Eubank of the Galena Oil Corporation, as vice-president. Mr. Down has been vice-president during the past year and Mr. Eubank is chairman of the Exhibit Committee.

Freight Shipments from the Exhibit

The Pennsylvania Railroad will have a freight representative in its Boardwalk validation ticket office in the Auditorium from Monday until the termination of the exhibit, from 9:00 A. M. to 5:00 P. M., daylight saving time, to assist exhibitors in the preparation of bills of lading and to furnish any other information that may be necessary.

Registration Figures

THE following comparative figures cover the registrations as of four o'clock yesterday afternoon and at similar times for the 1922, 1924, 1926 and 1928 meetings.

	1922	1924	1926	1928	1930
Mechanical, Division V	554	772	940	836	889
Purchases and Stores, Division VI	26	21	450	477	394
Motor Transport, Division VIII				41	64
Railroad guests				264	469
Railroad ladies	421	607	745	794	707
Supply men	2015	2300	2615	2419	2176
Supply ladies	432	546	600	646	488
Special guests	276	419	340	22	152
Complimentary				299	—*
Total	3724	4665	5690	5798	5339

*Complimentary registrations this year are included in Railroad Guests.

Railway Club Secretaries' Meeting

THE Association of Railway Club Secretaries will meet at 10 o'clock, daylight saving time, this morning at the Marlborough-Blenheim Hotel. Officers and members of executive committees of railway clubs are cordially invited to attend this meeting and take part in its deliberations. The purpose of the association has been to exchange ideas and experiences about club administration and activities in order that all may profit by such a clearing house.

MacBarmma Golf Club

THE members of the MacBarmma Golf League will have their annual tournament and dinner at the Seaview Country Club today. When the MacBarmma boys get together, the scores may not average as well as those that have been made this week in the British open championship tournament, but there is a lot more fun.

Truck Reports Close Motor Transport Meeting

MOTOR truck operation and competition constituted the theme of yesterday's session of the Motor Transport Division. With R. K. Stackhouse (Pennsylvania), chairman of the Motor Truck Section, presiding, a number of reports describing the various kinds of motor truck service provided by steam railways were presented by officers in charge of these operations. A feature of the morning session was an address of welcome by Gilbert E. Ryder, president of the R. S. M. A.

Carl R. Gray, Jr., vice-president and general manager of the Chicago, St. Paul, Minneapolis & Omaha, told of the trucking situation in the territory of his railway and described the operations and methods of the motor truck operating subsidiary of the Omaha, the Wilson Transportation Company. The trucks, according to Mr. Gray, are able to provide more direct service between certain points in South Dakota than that available by railway, and they have been successful in securing a large volume of traffic. Commodities of many kinds are handled, but foodstuffs predominate. The transportation company operates as a corollary of the railway, earning a profit on its own account and benefitting the railway by reason of the additional carload traffic attracted to the distribution centers from which the truck routes radiate.

D. W. Russell, vice-president and general manager of the Southwestern Transportation Company, a Cotton Belt subsidiary, described the truck operating methods of his company. His service, he said, was designed to bring back to the railway l. c. traffic which it can handle economically, and to carry by itself business which the railway can not afford to take. Store-door pick-up and delivery service is provided in all instances, but the rail service is used to a large extent, 70 per cent of the transportation company's business moving to some extent at least by rail. The truck service has made possible the elimination of a number of local freight trains, with substantial economies to the railway.

F. J. Carey, manager of truck service of the Boston & Maine Transportation Company, told of the truck operations of his company, stating that store-door collection and delivery service is provided in connection with the common carrier truck operations of the company, but no longer in connection with the B. & M. railway service.

P. J. Neff, vice-president and general manager of the Missouri Pacific Transportation Company, in a report on trucking activities of his company, said that cost and speed are the determining factors in the routing of freight. The transportation company has adopted the Pacific Motor Transport Company plan of providing store-door collection and delivery service in connec-

tion with rail service, and has noticed, as a result, a distinct trend on the part of l. c. l. freight from competitive truck lines back to the railway.

J. A. Cunningham, freight traffic manager of the New England Transportation Company, reported that his company is now operating 1,300 motor truck route miles, and has made it possible for the New Haven to reduce its local freight service materially and to speed up the remaining trains. The purpose of the truck operations of the transportation company is to make possible a more economical movement of the l. c. l. freight of the railway. Ordinary trucking service not so closely connected with the railway service, according to Mr. Cunningham, is virtually impossible in New Haven territory because of cut-throat competition between independent trucking lines. In many instances, l. c. l. freight is being accepted by truck lines for transportation at rates which represent practically what the shipper wants to pay and no more.

M. F. Steinberger (Baltimore & Ohio) presented a comprehensive report on truck competition and railway trucking operations in the eastern territory. The most serious competition which the railways are meeting, he said, comes from contract truck operators and not so much from common carrier truck lines. Other reports were presented by W. C. Clynn (Pennsylvania) and by H. L. Snyder (Union Pacific), representing J. P. O'Brien (Oregon-Washington Railroad and Navigation Company).

Following the presentation of an illustrated lecture on motor vehicle regulation and taxation by Pierre Schon, sales engineer of the General Motors Truck Company, the meeting adjourned.

Sacred Concert Sunday

FOLLOWING is the program of the Sacred Concert which will be given in the Ballroom of the Auditorium at 3:30 p.m. (daylight saving time), Sunday afternoon.

PART ONE

1 March—"Friendship" ..... *Althouse*
BAND

2. Overture—"Beautiful Galatea" ..... *Suppi*
BAND

3. "Canoe Song" ..... *George F. Root*
MALE CHORUS

4. "Shenandoah" ..... *Bartholomew*
MALE CHORUS

5. Tenor Solo—"I Hear a Thrush at Eve" ..... *Cadman*
HOWARD W. LINDAMAN

6. "Stein Song" ..... *E. A. Fensted*
MALE CHORUS

7. Suite—"Atlantis" ..... *Safraenk*
BAND

8. Selection—"Sweethearts" ..... *Herbert*
BAND

9. Solo—Selected
GRAND ORGAN

10. "The Bells of St. Mary" ..... *Emmett Adams*
BAND AND GRAND ORGAN

PART TWO

11. "Morning" ..... *Speaks-Baldwin*
MALE CHORUS

12. "Creation's Hymn" ..... *Beethoven*
MALE CHORUS

13. Tenor Solo—"I Know What It Means to be Lonesome" *Brookman-Vincent*
C. W. MANN

14. "Grandfather's Clock" ..... *Ira B. Wilson*
QUARTET

15. "Lassie O' Mine" ..... *Edward J. Walt*
QUARTET

16. "Songs of the Old Folks" ..... *Lake*
BAND

17. "L'Equestrian" ..... *Hosmar*
BAND

18. Solo—Selected
GRAND ORGAN

19. "In Vocal Combat" ..... *Dudey Buck*
MALE CHORUS

20. "Winter Song" ..... *F. Field Bullard*
MALE CHORUS

21. "The Lost Chord" ..... *A. Sullivan*
BAND, GRAND ORGAN AND COMBINED CHORUS

Registration, American Railway Association

Division V—Mechanical

Adams, Walter S., Des. Eng., J. G. Brill Co.
Allen, Miss F. D. Asst., to E. R. S., N. Y. C., Jefferson
Ashley, S. F., Asst. Ch. Draft., N. Y. C., Jefferson
Baldwin, Hadley, C. E., C. C. C. & St. L.
Beyerl, L. W., F. I., N. Y. C.
Bickel, Oliver, A., Draft., Reading, Stanley
Bon, I. C., S. & R., W., Ambassador
Boorse, T. H., E. Eng., Reading
Boyer, Chas. E., A. to C. C. I., P. R. R. Runnymede
Brick, Walter F., A. F., C. R. R. of N. J., Elaine
Brown, Chas. W., Gen. Supt., L. & N. E.
Buck, E. R., A. M. M., P. R. R., Iroquois
Budwell, Walter, M. M., N. & W. R. R., Ritz-Carlton
Butler, Elbert, Car Insp., A. C., Bender
Callahan, F. R., Supt. Yards, Pullman Co., Ambassador
Chenoweth, E. G., Genl Foreman, Cri. & P., Haddon Hall
Clarke, R. V., P. W. Insp., B. & M., Dennis
Cline, R. H., M. M., B. & O., Princess
Coffey, J. E., F P. Eqpt., C. R. R. of N. J., Lyric
Curry, Jas. L., R. F. of Engs., Monongahela Con., Lexington
Davis, D. W., Supt. Shops, L. V., Haddon Hall
Davis, H. T., F. C. C., Reading
Dodds, E. I., Jr., Draft., N. Y. C.
Doyle, J. S., A. G. M., I. R. T., Shelburne
Duffy, A F. I., I. C. C., Princess
Dunbar, W. R., D. C. F., D. & H., New Richmond
Duncan, J. A., Gen. I., N. Y. C.
Fleck, H. L., Gen. Supor., Penna., Eastbourne
Fletcher, J. G. F. C. D., S. A. L., Brighton
Flinn, Frank T., T. M., N. J. & S.
Flinn, R. H. Gen. Supt., P. R. R.
Flory, B. P., S. M. P., N. Y. O. & W. Ry., Marlborough
Fox, J. P., Asst. Rd. F. of E., P. R. R.
Galloway, A. K. S. M. P., B. & O., Shelburne
Gillies, W. H., G. F. E. S., L. I., Shelburne
Gillis, H. A., S. M. P. Retired, N. & W., Seaside
Gray, C. B., M. M., P. R. R.
Gray, Guy M., G. M. P., D. & L. E., Haddon Hall
Hargenhan, J. W., S. S. T., N. Y. C., Ambassador
Heeter, H. C., Asst Elec. F., P. R. R., Continental
Helme, C. F., M. M., L. V., Marlborough
Hesser, R. M., Asst. M. M., B. & O., Ritz-Carlton
Holland, H. L., Asst. Eng., B. & O., Glaslyn-Chatham
Howe, John Supt. Shops, B. & O.
Inglis, I. A., Spec. Rep. of Pres., W. M., Traymore
Jones, L. B., M. M., P. R. R. Brighton
Jordan, Chas. A., Car Eng., B. & O.
Kiesel, W. F., Jr., M. E., P. R. R., Dennis
Kinsley, D. F., G. B. I., P. R. R.
Knowlton, C. H., Asst. Engr. M. P., N. Y. C.
Laux, J. P., S. M. P., L. V., Marlborough
Lawson, A. B. Asst. Eng., B. & O., Glaslyn-Chatham
Leas, Z. J., Asst. For., Reading, Newfield
Lehr, Harry, W., G. F. P. C. I., P. R. R., Marlboro
Lentz, W. L., Engr. M. P., N. Y. C., Marlborough
Lowe, C. I., Secy., C. M. P., B. & O., Haddon Hall
MacLean, Lachlan W., Elect. Supvr., Reading
Mathis, B. H., Treas., W. T. C., Brighton
McKeown, Donald, Off. Engr., B. & M.
Mears, R. J., Ch. Draft., N. Y. C.
Miller, Albert L. Shop Draft., B. & O., Kentucky
Miller, J. R., C. C. Supt., of Shop, B. & O.
Mills, D. L., M. E., C. & N. W. Knickerbocker
Monarty, G. A., Genl. Mech. Supt., New Haven, Dennis
Naylor, Robt.H., B. I., Reading,
Neill, J. F., Com. Agt., Erie
Nix, E. A., F.C . D., N. J. C.
O'Brien, W. J., S. M. P. & R. S., N. Y. C., Haddon Hall
O'Connor, A. J., Car Design., Bd. of Trans., Jefferson
Parker, W. V., C. I., Tenn.,
Parker, Wm., Jr.,Asst. M. M., P. R. R.
Peach, J. F., Supvr. M. of E. S. & E., B. & O., Marlborough
Phetteplace, L. H., G. M., Chinchfield R. R., Chalfonte
Phillips, G. H., C. E. of M. of W., L. V. R. R., Marlborough
Phipps, John W., A. R. A. Inspector, B. & O. Thompson
Reed, H. B., Asst. S. Y., Pullman Co., Ambassador
Reinhardt, E. J., G. W. Supvr., L. V., President
Risley, Arthur, G. A. W., Reading, Atlantic
Ronalds, Hugh, M M., L. & N. E., Ritz-Carlton
Roy, E. H., S. M. P., S. A. L., Ritz
Schlatter, L. H., Test. Dept., P. R. R.
Scott, W. D., Draft., N. Y. C., Jefferson
Seidell, Frank M., A. B. I., Reading

Shanks, H. B., M. M., M. K. & T., Colton Manor
Smith, H. L., G. S. F., D. L. & W., Craig Hall
Snyder, G. I., V. P. & G. M., B. & L. E., Haddon Hall
Steins, C. K., M. M., P. R. R., Morton
Sterner, Albert L., Asst. For., Reading, Stanley
Temple, John L., Inspector, I. C. C., Princess
Thompson, M. O., W. Supvr., B. & M., Traymore
Tippett, Thos. B., Order Clerk, C. R. R. of N. J., Morton
Triem, W. R., Supt. Frt Transp., P. R. R.
Trump, J. William, Tenl. For., Reading
Walker, J. W., C. A. B. I., P. R. R.
Walker, Sylvester, A. G. F., P. R. R.
Webb, G. S., Asst. M. M., P. R. R.
West, G. S., M. M., P. R. R., Chalfonte
Whiteman, Roger C., I. T. B., B. & O., Carolina Arms
Wilber, Rollin H., V. P. & G. M., L. & N. E.
Williams, Morgan E., M. M., Reading, Jefferson
Williams, R. J., S. M. P., P. M., Shelburne
Wilson, G. A., M. M., P. R. R.
Wilson, G. T., Gen. Equip. Inspt., N. Y. C., Haddon Hall
Wise, Marion, Asst. to V. C., S. P., Haddon Hall
Yeager, Geo. F., Insptr., P. R. R.
Young, H. T., Genl. Agt., Erie

Division VI—Purchases and Stores

Anderson, E. H., Stockman, P. & S., P. R. R., Chalfonte
Bossler, Martin C., F. G. S. D., Reading
Burke, Arthur, Sub. S. K., Reading
Chubb, Elmer F., S. K., Penna., Pinehurst
Clewell, C. W., Req. Marker, Penna.
Cook, C. C., Mt. Ener., B. & O. Dennis
Dougherty, Jas. E., C. C., Reading
Fowler, J. B., S. K. Penna., Iroquois
Frank, D. E., S. K., Penna., Pennhurst
Garland, E. R., Supvr. P. D., Penna.
Hirsch, Wm., Buyer, P. D. Penna.
Johnson, P. J., S. K., Penna., Monticello
Kaltenbach, H. R., Req'n Marker, Penna., Penn Atlantic
Lieber, Geo. W., Supt. Rec., M. K. T. Ry., Ambassador
Morrison, Wm., Div. S. K., L. I., Shelburne
Neal, A. S., Supvr., P. A., Penna., Penn Atlantic
Ryan, Daniel, For. Gen. S. D., Reading, St. Charles
Shugarts, W. W., S. K., Penna., Monticello
Sidey, W. I., Supvr., S. & R., L. V., Monticello
Simpson, W. I., Reqn. Marker, Penna.
Smith, C. E., V. P., N. Y., N. H. & H., Traymore
Stow, Frank, S. K., Central R. R., Morton
Tinklebaugh, E. A., Str. Acct., F. G. Ex.
Tombs, G. D., D. S. K., Ill. Central, Shelburne
Toohey, H. R., I. of S., C. M. St. P. & P., Knickerbocker
Traister, Wray G., D. S. K., B. & O., Elberon
Turnquist, F. V., Asst. Str. Clk., B. & M., Chalfonte, Haddon Hall
Tynan, M. L., G. P. A., Ry. Ex. A., Ambassador
Urtel, E. J., P. A., B. & S., Chalfonte
Vanderbosch, C. J., Dist. S. K., B. & O., Haddon Hall
Vogt, W. F., A. G. S. K., P., Chalfonte
von Osthoff, Geo. W., P. A., S. P., Traymore
Wade, J. W., G. S. K., N. & W., Ambassador
Walden, G. H., P. A., C. M. St. P. & P., Ritz
Walsh, P. H., Retired G. S. K., A. C. L., Chalfonte
Walther, E. W., G. S. K., B. & O., Haddon Hall
Warne, C. C. 1st Asst. P. A., N. Y. Central, Shelburne
Warren, F. C., G. S. K., St. L. S. W., Traymore
Watkins, John W., Dist. S. K., L. V., Monticello
Webster, M. A., P. A., I. U., Kentucky
Weeden, R. E., Sunt. Roadway Shops, So., Knickerbocker
Weindel, Herbert, Insp. of S., U. P., Haddon Hall
Whaley, W. R. F., Stat. S. K., Penna., Elberon
Wharton, J. E., S. K., P. R. R.
Wheeler, C. R., Div. S. K., B. & O., Princess
White, E. W., G. Mat. Supvr., Penna., Penn Atlantic
Wiedersdorf, J. P., S. K., N. & P. B. L., Shelburne
Williams, D. A., Asst. to P. A., B. & O., Llewellyn
Williams, R. C., G. M. S., Penna., Haddon Hall
Williamson, M. M., Stat. S. K., C. of N. J., Jefferson
Wonnell, Grover, S. K., P., Jefferson
Woods, J. L., P. A., N. C. & St. L., Marlborough
Woodson, E. R., Sec. Ry. Acct. Of. Assn., Traymore
Yeamans, C. W., P. & S. Agt., C. & W. I., Ambassador
Young, C. D., G. P. A., P., Brighton
Young, J., Asst. P. A., Penna., Haddon Hall
Young, N. H., S. K., P., Knickerbocker
Zimmerman, H. J., S. K., Penna., Jefferson

Motor Transport

Cunningham, J. A., F. T. Mgr., N. Y. N. H. & H., Traymore
Hickman, Jas. A., Ind. Del., N. Y. C., Ambassador
Lloyd, Charles C., T. M., C. of N. J.

Special Guests

Abbott, W. W., Supt. N. Y. L. V., Ritz-Carlton
Adair, J. G., M. E., B. of L. I.,
Cina, F. P., Draft., N. Y. C.,
Cunningham, J. A., F. T. Mgr., N. Y. N. H. & H., Traymore
Cunningham, I. T., C. L. K. Supr. Div. Exp., Penna., Jefferson
Davenport, John D. Jr., Ritz
Davenport, L. K., Price Clerk, P. R. R.
Davis, Geo. T., C. F. A. W. M.
DeWald, R. W., Clerk, P.
Dickson, Geo. P., Clerk Ch. E., P. R. R.
Diehl, Robert F., Son of P. A., M. & O., Traymore
Doherty, E. T., Y. C., M. C., Madison
Donagan, Ernest H., Son of G. S. K., B. & M., Chalfonte
Dougherty, C. C., Val. Roadway Eng., B. & O., Marlborough
Downes, Chas. D., C. S. C. S. D., P. R. R.
Duryea, O. C., Shelburne
Dwyer, J. B., G. A., N. Y. C., New Belmont
Eckstein, Isaih, Car Inspector C. I., Penna.
Edwards, Ellis, T. F., L. & N. E.
Eitel, John, Traymore
Falloway, R. B., Jr., Ch. Abst. Clk., P. R. R.
Fessler, John W., Welder, A. C. R. R.
Fidler, A. H., Clerk, P.
Fink, Harold J., Com. Agt., N. & W.
Fitch, Harold W., Supr. Pub., D. H., Glaslyn Catham
Fitzgerald, J. M., Asst. to Chairman, Eas. Pres. Con., Traymore
Francis, Wm. H., Elect., Reading, Melbourne
Gailigan, Thomas J., Clerk, A. T. & S. Fe, New Belmont
Gale, Richard, Bonding For. Eng. Dept., Reading, Columbus
Galloway, W. D., Clerk Pur. Dept., P.
Gamble, W. L., Trav. Frt. Agt., B. & O.
Gary, Forest, Tremont
Gengor, Geo., For., C. R. R. of N. J.
Glynn, W. C., Asst. G. Traf. Mgr., P. R. R.
Goodnow, Daniel H., L. I., I. C. C., Llewellyn
Gordon, Robert, 3d, G. M., Phila. Car Line, Brighton
Gorman, Edward A., Jr., U. S. D. of A., Chelsea
Goshorn, H. R., G. C. A., Phila. Rapid Transit Co.
Grant, G. W., T. P. A., Penna., Madison
Gray, H. O., Supvr., P. R. R., Chelsea
Gray, W. C., G. M. & N., Ambassador
Grove, Geo. B., Spl. Rep., Penna., Penn Atlantic
Guest, Curtis C., C. I., Reading, St. Thomas
Guggioz, Harold, Clerk, N. Y. C., Haddon Hall
Gumaer, A. G., Sec., C. S., Breakers
Haac, M. N., V. P., Penna., Knickbocker
Haas, Alber, F., Asst. Supt. Marine Con., N. of N. H. & H., Traymore
Hagerty, John M., Haddon Hall
Hall, J. M., A. C. I., I. C. C., Shelburne
Hall, Wm. E., Pub. Rep., A. R. A., Traymore
Harlan, Geo. S., D. F. A., B. & O.
Heal, H. E., C. P. A., Penna., Madison
Hedges, Louis L., Publicity Rep., Atlantic City
Hickman, Jas. A., Ind. Del., N. Y. C., Ambassador
Hoffman, Dr. C. W., Surgeon, W. M., Chalfonte
Holder, J. W., I. of L., I. C. C., Marlborough
Howard Bayard H., 60 S. Elberon
Hughes, William J., Son S. K., Seaside
Huntley, Kendrick, Asst. H. C., Penna., Jefferson
Huston, Frederick N., A. V. P., C. V., Chelsea
Iwasaki, M., Res. Rep., Japanese Govt. Ry., Chelsea.
Jenkins, G. O., Pan Am. Co., Traymore
Jewell, B. M., C. N., Ambassador
Kauffman, Harry, Chelsea
Keens, F. G., Asst. Supt. M. of W., Reading
Kenney, N. S., Guest D. A. Williams, B. & O.
Kindermann, H. F., Guest of Asst. P. A. P., P.
Kinkel, A. C., Draft., B. & O., Kentucky
Kirkpatrick, H. A., Head Clerk, P. R. R.
Kuepper, G. C., Draftsman, Penna.
Lang, W. C. Jr., Jefferson
Larkin, Jos. A., Elect., The Pullman Co.
Lebediansky, L., Engr. Asst. Mgr., L. C. B., Breakers
Levy, Edgar M., Clerk, P. R. R.
Lewis, H., W., S. Engr., L. V., Ambassador
Liebach. Geo. C., Elect. M. P. Mg. Re. Dept., Reading, Newburn Cottage
Little, Joseph E., D. P. A., Penn., Madison
Lockwood, R. L., Dept. of Commerce U. S., Ambassador
Lubomudron, N., M. E. Mgr. Blr. S., K. L. Wks., Breakers
Lusk, Geo. W., TAT Air Lines, Strath Haven
McCloskey, Chas. E., Son of M. M., H. B. & T. Ry.
McCord, John P., Blr. For., Reading, Sterling
McCord, Robt. H., Draft., Reading
McCormick, Geo. W., Travl. Aud., Penna.
McConnell, H. T.
McGlathery, C. G., Gang For., Penna., Iroquois
McLane, J. J., E. P. A., I. C., Haddon Hall
McNamara, John, Grand Atlantic
McQuillkin, H. P., Haddon Hall
Miller, A. F., B. & O., Llewellyn
Miller, A. L., A. G. P. A., N. Y. C.
Miller, John, Shelburne
Miller, Richard, Shelburne
Monroe, William, B. R. & P., Traymore
Morningstar, E. E., Draft. B. & O., Kenington
Morris, E. B., Retired, c/o G. S. K., Reading, Madison
Morton, R. C., Senior Draft., B. & O., Kentucky
Nasahl, Craig E., Secy. to G. S. M. P., I. C., Sterling
Nealis, Frank P., Dist. F. A.
O'Brien, John, Princess
O'Donnell, Wm. J., Cheltenham Revere
Patterson, W. J., D. B. of S., I. C. C., Blenheim
Patton, C. S., Jr., Shelburne
Peck, C. J., Paymaster, K. C., Traymore
Peecock, P. R., Pass. Rep., Penn., Madison
Petrie, Robert, Draftsman, D. L. & W., Marlborough
Picker, K. Jr., Draft., B. & O., Kentucky
Prizer, J. R., Div. Engr., C. R. R. of N. J.
Ralston, H. W., Statistician, Penna., Chelsea
Ramacciotti, F. P., Drafts, Eng. R. S., N. Y. C., Chelsea
Robbins, E. C., Chelsea
Roberts, Chas. S., B. of S., I. C. C., Traymore
Roberts, Horace D., Sgt. Police, Reading
Robertson, B. S., S. A. B. of S., I. C. C., Iroquois
Rogers, J. C., Retired G. Paymstr., Penna. R. R., Hampton Court
Ross, H. P., Traffic Mgr., Brighton
Royer, W. C. Guest of O. O. Walsh Smp., A. & W. P., Ambassador
Rupe, Osborn B., C. C., Reading
Ryker, A. D., Engr., Penna.
Samejima, G., Asst. Eng., Japanese Govn't. Rys., Chelsea
Sands, Thos. I. of S., Con. Gov't., St. Charles
Schirmer, E. P. Sr., C. C. to F. C. D., A. C. R R.
Schuster, John, Tot Sol.
Shirley, John A., Asst. Ch. Inp., I. C. C., Shelburne
Shute, J. A., Clk. S. C. S. D., P. R. R.
Sims, Harry, Req. Marker, P. R. R.
Skog, C. A., G. F. A., G. T., Breakers
Smith, Chas E., Fuel Insp., Reading
Smith, Harold J., Princess
Smith, L. J.
Smith, Roy M., Asst. to R. S. M. A., Y. M. C. A.
Smith, W. T., Retired, S. M. P., C. & O., Dennis
Spangler, H. L., Son, Asst. M. M., Reading, Princess
Sparks, Preston S., P. A., Reading

(*Continued on Page 1548D8*)

Pick Walsh and Thomson To Lead P. & S. Division

THE eleventh annual meeting of the Purchases and Stores Division—A. R. A., came to a close yesterday with the election of C. E. Walsh, purchasing agent, Pennsylvania, as chairman, and L. C. Thomson, manager of stores, Canadian National, as vice-chairman of the association for the ensuing year. The following members were elected to serve on the General Committee for a two-year period: F. S. Austin, purchasing agent, Boston & Albany; J. L. Bennett, purchasing agent, Central of Georgia; G. W. Bichlmeier, general purchasing agent, Union Pacific System; L. P. Krampf, supply agent, Missouri Pacific; W. M. Davidson, general storekeeper, Illinois Central; E. F. Hasbrook, assistant purchasing agent, Chicago, Burlington & Quincy; and J. E. Mahaney, general supervisor of stores, Chesapeake & Ohio and Pere Marquette. In addition, a committee on nominations was elected as follows: E. A. Clifford, general purchasing agent, Chicago & North Western; L. P. Krampf, supply agent, Missouri Pacific; W. S. Morehead, assistant general storekeeper, Illinois Central; H. T. Shanks, purchasing agent, Louisville & Nashville, and A. L. Sorensen, manager of stores, Erie.

The election of C. E. ("Cappy") Walsh to Chairman of the Purchases & Stores Division is a recognition both of noticeably strong support which the Pennsylvania has continuously given the Division since its formation and Mr. Walsh's own active participation in the Association's work, a participation that has not been so obvious for "Cappy" is a quiet, unassuming type of fellow who has been perfectly willing to let others do the talking on the floor, but which has, nevertheless, been real and substantial as will appear from the attention he has given to the work of many of the committees.

He was born on September 20, 1882, at Uhrichsville, Ohio, and entered railway service as a storeroom clerk on the Pittsburgh, Cincinnati, Chicago & St. Louis, now a part of The Pennsylvania Railroad. On November 1, 1901, he was transferred from Columbus to the office of the purchasing agent of the Pennsylvania Lines West at Pittsburgh. After occupying various clerical positions in that office he was promoted to chief clerk in 1913 and on June 1, 1914, was advanced to assistant purchasing agent.

C. E. Walsh, Chairman Elect of the P. & S. Division

L. C. Thomson, Vice-Chairman Elect of the P. & S. Division

For a period of thirteen months from February, 1918, to March, 1919, he was in charge of the purchasing department of the Pennsylvania Lines West while the purchasing agent was serving on the Eastern Regional Purchasing Committee of the United States Railroad Administration. Under a revision of the organization of the purchasing department, January 16, 1924, he was appointed assistant purchasing agent of the Pennsylvania Railroad with headquarters at Philadelphia and on January 1, 1927, was promoted to purchasing agent.

Mr. Walsh began to participate prominently in the work of the Purchases & Stores Division in 1920, as chairman of the committee on purchasing agents' office records, serving as chairman of that committee for four years. He has continued to serve as chairman ex-officio

of that committee as well as of the committees on stationery and printing up to the present. In 1922 he was also a member of the nominating committee and in 1929 also chairman ex-officio of the committee studying commissary and dining car supplies. He became a member of the general committee in 1925, was re-elected in 1927 and has been a member of that committee throughout the last three years. He was elected vice chairman in 1929.

Mr. Walsh has rather shied away from speech-making but made several forcible and direct-to-the-point speeches in the last two or three years. He is particularly known for the broad-gauged position he has taken in the matter of public relations and the arrangements he has studiously made and maintained for the courteous and systematic attention given not only to representatives of manufacturing firms but everyone making business calls at the Pennsylvania purchasing offices. He is not a crank on golf but includes it among his diversions and is known for his ability to maintain his equipoise and geniality of disposition even when the ball goes in the rough. Last year he got air-minded and flew from San Francisco back East and since that time has been busy telling his friends about the advantages and the comforts of the T. A. T.

There is another thing about "Cappy" Walsh which many of his friends perhaps do not know. He is not only a daddy of three fine sons and a daughter but also the grand-daddy of Charles Edward, or "Cappy the Third."

In acknowledging his election, Mr. Walsh said in part: I am quite sure that the entire management of the Pennsylvania as well as the executives of the purchasing and stores department of the Pennsylvania will appreciate the election of one of their officers to the important position of chairman of the Purchases and Stores Division of the American Railway Association. I too deeply appreciate the honor and sincerely hope my administration of the duties of that office will meet with your approval.

In electing L. C. Thomson vice-chairman, the Purchases and Stores Division has at one stroke registered its long regard for and good feeling toward the railways of Canada, and drafted into its service a man who has proved his ability to serve the interests of the Division and the interests of the purchases and stores departments of the railways in this country in a substantial way.

Mr. Thomson was born at Kingston, Ont., November 25, 1882, and has been in railway service almost continuously since 1897, when he entered the store department of the Canadian Pacific as an office boy. He worked as a storekeeper at a number of points, as district storekeeper and as chief clerk on the Canadian Pacific until 1907, when he left that road to organize a stores department on the eastern lines of the Canadian Northern, now part of the Canadian National. He was appointed general storekeeper on that road in November, 1914, and continued as general storekeeper until 1915, when he was loaned to the Imperial Munitions Board and British War Mission, with which he served as superintendent of transportation during the World War.

Returning to the Canadian National in 1919 Mr. Thomson resumed his work as general storekeeper of the eastern lines until 1923, when he was promoted to chief of stores of the system, a position he held until his appointment as manager of stores of the greater Canadian National system in 1927, which includes the Grand Trunk Western.

The size of Mr. Thomson's responsibility in that position is indicated when it is considered that the Canadian National Railways comprise 25,000 miles of line, extending from the Atlantic coast to the Pacific coast, and from Chicago to the Hudson bay, a position which carries the responsibility of supervising and directing the activities of 2,300 men and controlling, under the direction of the vice-president of purchases and stores, the disbursing of and accounting for approximately $165,000,000 worth of material a year and an inventory of $21,000,000.

It was this responsibility and the responsibilities shouldered during the war that led Mr. Thomson to develop and install on the Canadian National the visible card system of stock keeping that is now being studied so thoroughly in this country and for which Mr. Thomson is best known by his American associates.

His responsibility has not been so large, however, as to prevent him from contributing actively in the affairs of the Purchases and Stores Division, to which he confesses an indebtedness for the help which it has afforded him.

In 1924 he served on the committee developing store department rules; in 1927 served on the committee on shop manufacturing orders and from 1918 to 1930, has also served on the committees on controlling line stocks, on stores department buildings and facilities for handling material, on the selection and training of employees for purchases and stores work, and on the first committee studying capacity loading and prompt handling of company material. During the last year he has also been a member of the committee on subjects, and a member of the General Committee. He will be remembered as the author of an interesting paper at last year's convention on his system of stock bookkeeping. Mr. Thomson was elected president of the Canadian Railway Club in May, 1930, and was among the prominent speakers at the International General Foremen's convention in Chicago last year.

REGISTRATION

Special Guests

(*Continued from Page 1548D6*)

Strollo, M. H., Asst. T. M., C. R. R. of N. J.
Taltavall, A. A., Asst. Engr., Penna. R. R., Ventnor, N. J.
Thebault, L. J.
Thorn, Willis W., Ambassador
Trainer, J. E., Req. Marker, P. R. R.
Travin, P., Car Design, Russian Railways, Moscow, Chelsea
Turner, Larry, A. C. I., N. & W., Arcadia
Ulanov-Zinoviev, C. D., U. S. S. R., Breakers
Vladimirov, M. F., S. of S., U. S. S. R., Breakers
Warov, V. V., Brighton
Wentz, Walton, M., E.—T. Penn. News, P.
Wharton, Fred. Sk., Penna.
Wharton, R. W., Draf., Penn., Chalfonte
Widdoes, John O., Req. Marker, P. R. R.
Williams, Perry, C. & O. R. R., Ritz-Carlton
Wilson, G. E., P. Dept., Reading
Woodward, V. E., Pass. Rep., P., Madison
Yamamoto, S., Asst. Mech. Eng., Japanese Govt. Rys., Chelsta
Yohe, C. M., V. P., Erie, Traymore
Yula, Ralph, C. I., Reading
Yzewyn, Julian M., Com. Rptr., A. R. A., Ambassador
Zimmerman, H. C., Ord. Eng., War Dept., Jefferson
Zussy, C. J., Trov. Insp., N. Y. C.

WITH THE AID OF FOREIGN CAPITAL, the Polish Ministry of Transport plans expenditures of £137,000,000 (about $665,000,000) on the improvement of Polish railway communications within the next 10 years, according to an article in Modern Transport (London). Approximately £3,000,000 will be devoted to the reconstruction of existing facilities; £90,000,000 to track and roadbed improvements, yard and siding construction, and improved signaling installations; and £44,000,000 to the building of new railway lines in southern and eastern Poland and the purchase of rolling stock.

Conventionalities

C. C. Gaskins, of the Keyoke Railway Equipment Company, thinks he is some bowler and will take on all comers. He has a perfect score to his credit in a recent championship tournament. Mr. Gaskins was connected with the Pullman Company for many years.

Mr. and Mrs. C. E. Fuller made a trip abroad last year visiting Norway, Sweden, Iceland and Russia, and returning home by way of France. They are planning to leave for Europe again soon after the close of the conventions.

W. L. Allison of the Baldwin Locomotive Works and Mrs. Allison dropped in yesterday to celebrate their seventh wedding anniversary by looking over the exhibits and meeting their old friends.

Walter S. Doering, who formerly attended the conventions as vice-president of the Bradford Corporation, is attending them this year as vice-president of the American Steel Foundries, with headquarters at St. Louis.

Leroy Kramer will be joined at the conventions by Mrs. Kramer and their daughter, Miss Julia. The young lady has been attending Wheeler College at Providence, R. I. Her mother joined her there and they are motoring down from New York.

Tom Dickinson visited the RAILWAY AGE booth Friday morning and informed us that we were all wet about his being storekeeper at Greenville, Pa. We acknowledge the mistake and make a correction herewith. Tom is assistant purchasing agent for the Bessemer & Lake Erie with headquarters at Pittsburgh, Pa.

Among those attending the conventions who have shown great interest in everything in the exhibit hall are Bert M. Jewell, president of the Railway Employees Department of the American Federation of Labor, and Capt. O. S. Beyer, consulting engineer of that organization. Mrs. Beyer joined them Friday.

A number of people who attended the ball Thursday night discovered that it was almost impossible in so large a hall to find their partners without previously arranging a rendezvous. This circumstance can be used effectively as an alibi, but we suggest that a failure of any kind is no credit to the operator.

J. Will Johnson of the Pyle-National Company, and a former president of the R. S. M. A., says that just because business is a little bit light in the railroad and aviation fields is no reason why it is not thriving in other directions. His company is having an interesting experience in installing electric lighting apparatus in the ball parks of a number of minor league teams. It is from these teams that players are recruited for the major leagues. To make a financial success of these minor league teams it is necessary to have attendance at the games and it is difficult in the smaller communities for men to get away from the shop and business early enough in the afternoon to attend the games. It has been found, however, that by lighting the ball parks and playing in the late evening, it is possible to get a large attendance of spectators and to carry on these minor league teams on a profitable basis. With the artificial lighting it is easy to follow the ball and the plays; indeed some claim that it is easier than in broad daylight.

George Wenyven of the San Francisco office of A. M. Castle & Co. has brought with him this year his associate, Len Herritt, to initiate him into the Atlantic City convention atmosphere. This is Len's first trip east of Reno.

W. E. New, master mechanic of the Kansas City Terminal, is attending the conventions in the custody of his daughter Nellie Virginia. Miss New is a junior in high school. This is the second A. R. A. convention which she has attended at Atlantic City.

One of the features which stands out this year perhaps more than at previous exhibits, is the large number of working models. It may be that the better perspective afforded by the compact arrangement of the exhibit booths on the two floors of the auditorium gives the observer that impression.

J. A. Mooney, former general storekeeper of the Pittsburgh & West Virginia, has been attending the sessions of the Purchases and Stores Convention for the first time as a supply man. He left the Pittsburgh & West Virginia at the end of last year and is now sales manager for the Keystone Grinder & Manufacturing Company, Pittsburgh, Pa.

J. B. Ennis, vice-president in charge of engineering of the American Locomotive Company, will be missed from the convention this year. He left on June 11 for England and the Continent and expects to return some time early in August. Undoubtedly he will critically study locomotive developments abroad to see what he can find that will be of particular interest to the locomotive designers in this country.

Mr. and Mrs. George A. Johnson, Chicago, are as usual in attendance and are at the Chalfonte. Having given the best of his life to the subject of efficient draft gears, Mr. Johnson's rewards number among others his recent election as executive vice-president of W. H. Miner, Inc., in addition to having charge of manufacturing and patents.

After having attended the Atlantic City conventions for years in various capacities, Frank McManamy is attending them this year as chairman of the Interstate Commerce Commission, the highest of all government offices that directly relate to transportation. He is, as usual, accompanied by Mrs. McManamy, and will address the Mechanical Division at its session on Monday.

Alec Spencer, chairman of both Metropolitan Vickers and Spencer Moulton, and vice-chairman of The Superheater Company, Ltd., three prominent English concerns, is at the conventions this year introducing the Spencer Moulton rubber spring, which has been in suc-

cessful use on English and Colonial railways for more than half a century. The rubber used in the construction of this spring is made to a special formula and has many applications to truck construction. It was first applied in 1851 by Mr. Spencer's father and has very extensive use today, being standard on the London & North Eastern and other lines. Some trial installations of the spring are now in service on American railroads and Mr. Spencer is showing full-size applications of his special rubber to truck service at the Waugh Equipment Company's booth.. Mr. Spencer, true to English traditions, is an ardent golfer. Although 74 years old, he is a nine-handicap man. He played golf six years before a ball was teed-off in this country and was at one time captain of the Black Heath Golf Club, the first playing club in Great Britain.

Frank W. Edmunds, special representative of the Edison Storage Battery Company, Orange, N. J., is attending the conventions for the 49th consecutive time. Mr. Edmunds is president of the school board of West Nyack, N. Y., and left Atlantic City last night to attend the commencement exercises of the West Nyack school and award the diplomas to the graduates. He will return to Atlantic City on Saturday.

The friends of D. P. Morgan will be interested in learning that he has resigned his position with the Gustin-Bacon Manufacturing Company and is now with the Garlock Packing Company, with headquarters in Philadelphia. Mr. Morgan has been an active member of the Air Brake Appliance Association for many years, serving as chairman of the Committee on Arrangements when the Air Brake Association convened in Washington, D. C.

For the first time in twenty years, because of an emergency trip to California, R. L. Skidmore, St. Louis representative of the Monongahela Iron Company, Pittsburgh, Pa., is not attending this year's conventions. "Skid" believes in business before pleasure but wishes his many friends in attendance a pleasant time and assures everyone that he will be with them in 1932.

H. H. Westinghouse, chairman of the board, Westinghouse Air Brake Company, who has attended many a convention and has watched the growth and change from the old Master Car Builders' Association and Master Mechanics' Association into the American Railway Association, was a welcome guest on Friday. Accompanied by A. L. Humphrey, president, Westinghouse Air Brake Company, the new surroundings were inspected and old friendships renewed.

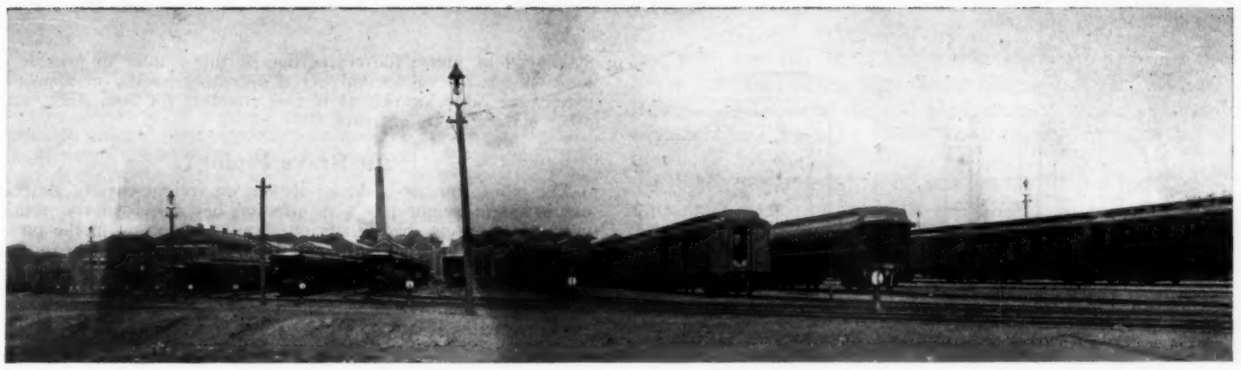
Among the "old timers" is Charles E. Postlethwaite, familiarly known as "Posty", long identified with the Pressed Steel Car Company. "Posty" came near missing the convention, however, because of an accident to Mrs. Postlethwaite. It seems that in mounting a small step ladder she slipped and broke the upper bone of one of her limbs, near the thigh. Fortunately, the prognosis indicates ultimate recovery without serious interference with her ability to walk.

R. V. Clark, car foreman, Boston & Maine, has been attending the conventions with his son John, superintendent of the car department, Central Railroad of New Jersey. Mr. Clark is proud of his son John, but he is also filled with pride for his son Arnold who has just returned with the Byrd South-Polar expedition from the Antarctic. Mrs. Clark was in Washington, D. C., Friday, when the members of the Admiral Byrd party were received by President Hoover and the members of his cabinet.

James Partington of the American Locomotive Company, arrived yesterday to join his wife, who had come down earlier in the week. Jim is one of the happiest boys at the convention. Ambassador Dwight W. Morrow was a classmate of his in the Pittsburgh schools and he has pleasant recollections of many a good swim with the Ambassador in the Ohio river. It is hard to think of Jim in the light of politics, but he did make a couple of fine political addresses in the Oranges in the Ambassador's behalf, during the closing days of the New Jersey senatorial campaign.

John F. O'Connor, conspicuous in the roll of American inventors, is to be seen daily as an interested spectator among the exhibits. Years ago a machinist in a railway shop, then locomotive inspector, forman of shops, Mr. O'Connor's rise became rapid. Later he became mechanical engineer, then consulting mechanical engineer. Many patents relating to railway devices have been awarded to him. One of the most important of these is a device for indicating with extreme accuracy the reaction developed upon impact of two bodies at high speed. The device has been of great help in measuring the stress endured by the draft gear. It is said that in recent years there has never been a time when Mr. O'Connor has not had at least a hundred patents pending action in the Patent Office at Washington.

T. Duff Smith, lake forwarding agent (fuel) of the Canadian National and a past-president of the International Railway Fuel Association, visited the Mechanical conventions at Atlantic City this year for the first time. Not being acquainted with the ropes and having something of a reputation as a practical joker, Vice-Chairman Tate of the Enrollment Committee, when Mr. Smith, as he registered, asked what the charges would be, replied, "Five dollars please." Mr. Smith is a good Scotchman and Mr. Tate was so surprised at the readiness with which he dug up, that he pocketed the five, after getting Mr. Smith to autograph it. It is hard to beat a Scotchman, however. The next day Mr. Tate ordered some snapshots from the boardwalk photographer while Mr. Smith was with him. The smallest change that Mr. Tate had was a ten-dollar bill. The photographer was not able to change it, but Mr. Smith offered to do so. Pocketing the ten-dollar bill, he handed Mr. Tate five dollar bills. The latter remarked that he thought he had been short-changed. Mr. Smith's reply was that they were even now and that Tate could collect the differences from the Enrollment Committee. The laugh is on the other side! You can't beat a Scotchman—that is, unless you are Chinese.



Third Session of Mechanical Division

Address by M. J. Gormley and discussion of reports on wheels and car construction

THE third session of Division V—Mechanical was called to order by Chairman Smart at 9.30 yesterday morning. The principal address at this session was made by M. J. Gormley, executive vice-president American Railway Association. Due to time limitations it was not possible to publish in yesterday's *Daily* the report and discussion on Brakes and Brake Equipment. This report immediately follows. The report of the committee on Wheels was carried over from Thursday's program and presented at yesterday's session.

Report of Committee on Brakes and Brake Equipment

October 1, 1931, recommended as final date to equip passenger cars with 2-in. metallic steam-heat connectors

G. H. Wood
Chairman

The present recommended-practice bottom-rod support for freight cars consists of a stirrup attached to the truck frame, and has been applied in large numbers by the railroads generally to new equipments. However, there are in service a greater proportion of cars not so equipped. Because of the accidents which have frequently occurred on account of bottom rods and brake beams dropping on the track, your committee has been requested to reopen this subject with a view of providing for the application of an efficient bottom-rod and brake-beam safety support to all cars in interchange, with as little delay as possible.

In order to avoid the necessity for revamping the brake-gear supports on many existing cars having brake-beam hangers and hanger attachments not altogether adequate, we recommend the following:

1—Revise the drawing shown on Page 3-1928 of Section E, Manual of Standard and Recommended Practice, in accordance with the drawing shown as Fig. 1.

2—Add a new paragraph to the page in question, reading: "(c) Four-wheel freight car trucks having inside-hung brakes shall be equipped with brake-beam safety support, as shown on accompanying drawing, or its equivalent in strength requirement."

3—Submit to letter ballot the proposition of adopting the foregoing as standard.

If the foregoing is adopted, we would also recommend, subject to approval of the Arbitration Committee, addition of a new section to Interchange Rule 3 to read substantially as follows:

"On and after ..... no car will be accepted from owner unless equipped with A. R. A. standard bottom-rod support and brake-beam safety support or its equivalent."

In submitting the foregoing we are mindful of the fact that many roads are using brake-beam safety supports which in design may not conform strictly to what is recommended—such, for instance, as Creco three-point and four-point supports, Buffalo supports, Creco economy safety guards, etc. We believe, however, these supports, at least the majority of them, will meet all requirements, and if necessary the rules can in time be so interpreted. In fact, we would not hesitate to support such a recommendation if it should be made.

Our thought in recommending what we are proposing is to make compulsory the application of what we have found to be the cheapest arrangement that will afford desired protection, leaving it with individual carriers to use anything of their own choice that will meet minimum requirements.

Changing Graduating Spring in Freight Triple Valves

Graduating springs applied to A. R. A. standard K type triple valves by the air-brake manufacturers are designated as "graduating spring, Piece Number 1057." We recommend substituting for the above a spring designated by the air-brake manufacturers as Piece Number 18286.

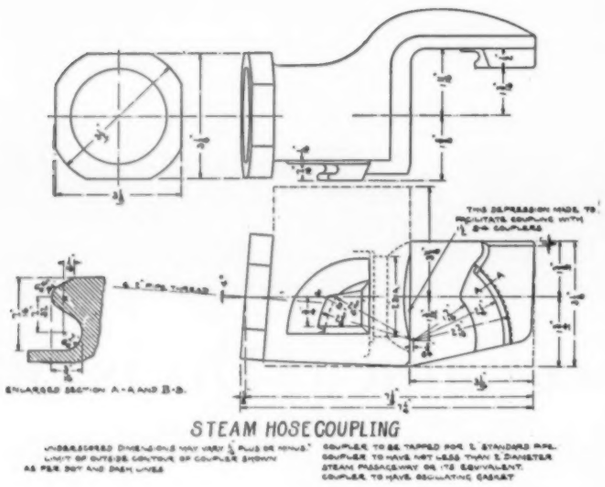
Train Delays Attributed to Steam-Hose Failures

The question of a definite date at which time passenger cars shall be equipped with 2-in. metallic steam-heat connectors has been considered by this committee, and it is the consensus of opinion that January 1, 1931, will not permit sufficient time to take care of the matter properly. The committee appreciates that the question is of sufficient importance to justify as prompt action as possible and, in order to provide for the development of a satisfactory metallic steam-hose connection, recommends that all load-carrying cars, such as mail, baggage, express, horse cars, etc., be equipped with metallic connections by October 1, 1931.

The committee is of the opinion that it will be entirely practicable for the railroads to comply with this recommendation.

Standardization of Contour Lines for Steam Hose Couplings

In view of contemplated changes increasing the opening in steam-heat couplings, end valves, etc., from 1½ in. to 2 in., it has been thought advisable to revise drawings now contained in



Proposed Coupling for Steam Hose Connections

the manual to provide for the larger size coupling. Accordingly, the subject has been reviewed by a sub-committee, who has prepared a drawing showing the contour lines and over-all dimension for 2-in. steam couplers. The proposed contour dimensions of the 2-in. coupler are the same as we have had for years and now shown in the manual for 1½-in. couplers. The other dimensions involved, with a few minor exceptions, have been satisfactory to all to whom they have been submitted.

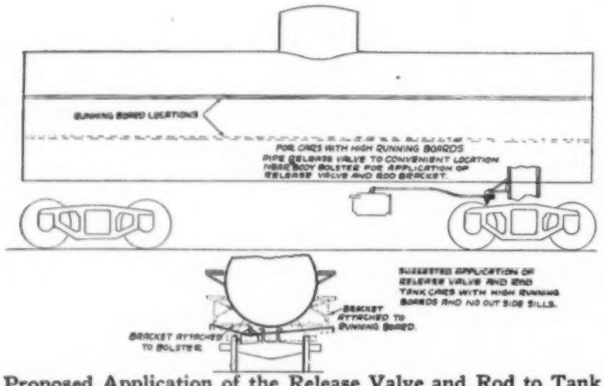
Your committee, therefore, recommends substituting drawing, Fig. 2, covering the proposed 2-in. coupler for that which now appears on page 79, Section E, of the Manual of Standard and Recommended Practice.

Short Release Rods on Tank Cars With High Running Boards

Complaint has been received by your committee regarding the manner of supporting release rods on tank cars having running boards located considerably higher than the center of the car coupler and having no outside sills. In many cases a rod 12 in. to 24 in. long is attached to the release valve with no means of support for the outer end on the auxiliary reservoir side of car. The rod, being nearly vertical in position, necessitates trainmen or others stepping inside the rail to reach the rod handle.

The location of the release-valve rods on tank cars with running boards approximately 30 in. above the center line of the coupler are not satisfactory, as they are attached to the running board with a short bracket, with the result that the release-valve rod is on an angle of approximately 45 deg. and the operating handle is so located that it requires trainmen to stand on the end of the tie to operate it where the roadbed is elevated, as is usually the case outside of station yards. We are submitting drawing shown as Fig. 3 suggesting methods which might be employed to support release-valve rods on the cars in question.

As a result of our investigation, we would recommend that a suitable substantial bracket be designed for tank cars having high running boards, as well as those with running boards approximately 30 in. above the center line of the coupler to provide a location for the release-valve rod operating handle in approximately the same location as is now standard for box, stock, and other classes of freight cars.



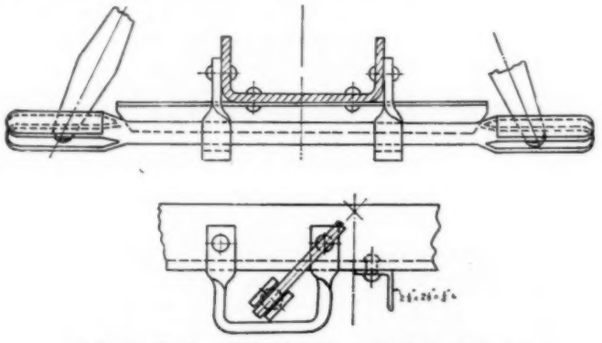
Proposed Application of the Release Valve and Rod to Tank Cars Having High Running Boards and no Side Sills

Air-Brake Piping

The piping for air-brake equipment on freight cars in general use is single-weight pipe. A question has arisen in connection with efforts being made to bring about a reduction in the number of failures of air-brake piping on freight cars and a reduction in the normal leakage from the brake system. It is our recommendation that the pipe for air-brake equipment for freight cars be extra heavy, except the nipples at the angle cocks, which should be standard weight.

Separate Cleaning of Defective Triple or Cylinder Control Valves on "In-Date" Passenger Cars

Passenger car Rule 7, Section J, provides that triple valves or control valves must be cleaned, oiled and tested at least each 12 months. However, it is found necessary at times to remove a triple valve or control valve on account of becoming defective in a shorter period of time than that specified above. The question is raised with reference to billing car owners in such cases. From an air-brake point of view, there is no objection to cleaning the brake cylinder and triple or control valve separately, but it is the opinion of this committee that the last sentence of Passenger car Rule 7, Section J, does not permit billing the car owner for cleaning the triple valve or control valve unless the dirt collector and strainer is cleaned at the same time. Also, we see no objection to stencilling the cylinder and triple or control valve separately, provided the foregoing is complied with.



Bottom Rod and Brake Beam Safety Support

We refer this matter to the Arbitration Committee for attention, considering the position of this committee with reference thereto.

Maltreatment of Triple-Valve Pistons

Our attention has been called by a member road to the practice of improper repairs to triple valves with the following statement:

"We are receiving quite a number of triple valves at our repair rooms from foreign-line cars which show clear evidence of the piston having been struck or pressed on the brake-pipe face with the apparent object of lengthening the stem. I assume this is being done in cases where the feed groove in the bushing is found to be too long and the idea of the repairmen is to set the piston in the ring out further in order to close the feed groove at the proper time. This abuse fractures the piston where it joins the stem.

"I am sending you a piston from a triple valve which was sent to the New York Air Brake Company for general repairs in the exact condition found when the triple valve was dismantled while I was at the factory. I am also sending you another piston which has been abused in the same manner, and which I had broken in order to ascertain how far the fracture caused by the repairman had extended."

In our opinion, it is impossible to make proper repairs in this manner, because repairmen do not have means of accurately measuring the proper position of the piston with reference to the feed groove, and in the ordinary repairing of triple valves it is likely that pistons so treated will find their way into bushings for which they were not intended and thus aggravate the situation on account of not opening the feed groove properly. It is possible that triple-valve cylinder bushings are being applied locally or by concerns other than the air-brake manufacturers,

in which case such practice should be scrutinized closely to determine if proper care is being exercised to provide the precision necessary to avoid necessity for non-standard triple-valve piston stems. We strongly urge the railroads generally to canvass this situation among their repairmen in order that the practice will be eliminated, and wish to direct attention to paragraph 144, page 40-E, of the Manual of Standard and Recommended Practice, in which it is suggested that work of this character should be done by the air-brake manufacturers.

The report is signed by G. H. Wood (chairman), supervisor of air brakes, Atchison, Topeka & Santa Fe; T. L. Burton, air brake engineer, New York Central; B. P. Flory, superintendent of motive power, New York, Ontario & Western; J. M. Henry, assistant chief of motive power, Pennsylvania; M. A. Kinney, general master mechanic, Hocking Valley; H. A. Clark, general air brake inspector, Minneapolis, St. Paul & Sault Ste. Marie; W. H. Clegg, chief inspector of air brakes and car heating equipment, Canadian National; Mark Purcell, general air brake inspector, Northern Pacific; R. B. Rasbridge, superintendent car department, Reading; G. E. Terwilliger, supervisor of auxiliary equipment, New York, New Haven & Hartford, and W. J. O'Neill, general mechanical superintendent, Denver & Rio Grande Western.

Discussion

Mr. Bodemer: I want to call attention to the bottom brake beam support consisting of an angle 2½ in. by 2½ in. by ¼ in. rigidly riveted to the bottom of the spring plank. The Committee recommends that this be applied to all freight car trucks.

On our road we have had serious trouble with that form of construction. It is almost impossible to keep such supports tight, the rivets will become loose. We found that condition not only on our own cars but also on many foreign cars that were similarly equipped. It developed into such a serious condition some years ago when we had a large number of cars equipped in a somewhat similar manner except that instead of only one angle we had two angles riveted to the bottom spring plank spread approximately 36 in. apart.

We could not keep the angles, which were riveted rigidly to the spring plank, tight enough to keep them from being lost off on the line of road.

I believe a support of that kind constitutes more of a menace than a safeguard. There is no question but what it is advisable to have something as a safety support for brake beams but I am afraid the style recommended will prove to be seriously objectionable rather than any help. I am sure that if the committee will give the subject further consideration by making an inspection, just a check at different terminals, they will find any number of these brake beam supports missing or rivets lost out and the brake beam supports hanging down.

We had some twelve or fifteen thousand cars equipped with the angles as I have described before on new cars constructed about six or eight years prior to 1926 and when the committee came out with their recommended practice for applying the bottom brake rod support, we removed those devices and substituted the bottom beam support.

We found the angles so troublesome it was absolutely necessary to remove them. I had a check made recently at our own terminals of a number of cars equipped like that and I found about 75 per cent of the supports riveted to the bottom of the spring plank loose, constituting a menace.

Mr. Burton: Mr. Bodemer's experience has been exactly the same as mine and many others. Fortunately, he has given the cause for it. That is, where you used two bars with the spring plank, it was impossible to remove and replace them satisfactorily. Frequently the brake beams were removed and reapplied at places where they could not properly rerivet the bars.

The New York Central has a great many cars equipped with two-bar installation that we used prior to the brake bar supports. The brake beams can easily be removed and replaced upon those cars without any bad rod supports and we have found no difficulty in maintaining them.

On the other hand, I do not know of any beam support that does not have to be riveted or bolted to the spring plank in some manner, so what does construction have to do with it? It has to be fastened to the spring plank, or else the beam will not be supported.

The committee is not asking anybody to use this support. We are asking you to use something equivalent to it.

Mr. Tatum: We have had several serious accidents due to the bars dropping down and engaging the ties, lifting the cars off the track.

We now have 110,000 cars equipped with the device set forth in this report. They are riveted on and we have had them in use now for more than 10 years. We have never had to cut a rivet out of any one of them on account of being loose.

Mr. Bodemer: I want to know whether Mr. Tatum's application includes the angle riveted to the bottom of the spring plank; whether his cars are equipped in that way, or just merely equipped with this bottom rod support. I am speaking only about the angle riveted to the bottom of the spring plank.

Mr. Tatum: I am not speaking of the angle. I am speaking of the loop riveted to the angle. About this angle on the bottom, I do not know. We have none of them.

Mr. Bodemer: I would like to ask you whether you consider that the bottom-rod loop acts also as a brake beam support?

Mr. Tatum: Yes. We only use it as a brake-beam support.

Mr. Bodemer: You do not consider the angle necessary in addition to that loop?

Mr. Tatum: No.

Mr. Bodemer: That was the point I would like to bring out. I would like to ask Mr. Burton to repeat what he stated about having a number of cars on the New York Central equipped with this single angle for a number of years, which he has found satisfactory.

Mr. Burton: Since about the time the loop support for the bottom rod was adopted, we have had something like eight or ten thousand cars in service for three or four years.

In regard to your inquiry to Mr. Tatum as to whether or not the strap under the bottom rod could be considered a brake beam support, the committee's investigation did not indicate that that could be done. In the majority of cases it would keep one beam off the track, if the hanger failed on either side of the beam from the strap it would keep that one off the track, but if it failed on the opposite side, it would not. That was the result of the committee's investigation.

Chairman Smart: I know of a number of railroads which are not placing the bottom rod on the beam part of the lever. The bolsters are cored out and the bottom rod is passed through. I know from experience that a lot of brake beam trouble is caused by having the bottom rods connected as shown in the report. Cars are pushed in over hundreds of tracks. What happens? The bottom of the levers stick into the ties and buckle up the brake beams. You can get away from a lot of that trouble if you put the bottom rods through the bolsters. In passing them through the bolsters you then have a good support for them, and there is no danger of the bottom rod dropping down.

Mr. Tatum: You speak of bottom rods through the bolster. Do you mean under the bolster?

Chairman Smart: Through the bolster.

Mr. Tatum: I know of a number of roads having a construction that will bring the bottom rod between the bolster and the spring plank, and that is just as good as this device.

Chairman Smart: No. This goes through the bolster. The cast steel bolster is cored out so the bottom rod will pass through, and the bottom rod is connected above the brake beam. In other words, the bottom part of the brake lever is connected to the brake beam, and the connecting rod is passed through the bolster.

The Canadian National has over 75,000 cars equipped that way, and we do not have any trouble with bent brake beams when a car goes off the track.

G. E. Terwilliger (N. Y. N. H. & H.): It is not my purpose to take issue with the committee of which I am a member. This paper is a recommendation that is supposed to be the unanimous recommendation of that committee. It is not unanimous, because I have registered a dissenting vote on the steam heat connection proposition. What I am referring to is the metallic steam heat connection. All front-end or head-end cars are supposed to be equipped on or before October 1, 1931. At the present time we have about 37,000 cars of that character in the country on Class 1 railroads. The material required to make this change will involve an expenditure of $1,850,000, approximately, for material alone, to say nothing about the labor. The New Haven can't afford it, and we are not going to. I do not think the time is opportune to make such a recommendation, because many of the steam heat connections are still in their experimental stage. One manufacturer has redesigned the steam heat connection within the past ten weeks. There are six or seven designs on the market.

Mr. Burton: Mr. Terwilliger talks of the tremendous expense to which the New Haven would be put in complying with the recommendation. It applies only to passenger equipment cars over interchange.

C. E. Chambers (C. N. J.): I would like to ask Mr. Terwilliger if, in compiling his costs, he took into account what he would pay for steam hose put on these cars for a year or two, which the metallic connections will dispense with. My understanding of these long, through trains in trunk line service is that it takes about four to six sets of hose every year, and I understand on some Canadian roads that after a round trip from coast to coast and back they have to be changed.

Mr. Nystrom: I would like to go back to the bottom-rod support and the brake-beam support. In talking of the bottom-rod support I referred to the loops now riveted to the spring plank. They cannot be applied to a great number of cars equipped with the Bettendorf type of spring plank, because the vertical flanges are not of sufficient height.

I wish to call attention to the bars. As to the brake-beam support, that is the angle iron riveted to the bottom side of the spring plank. That is an absolute failure. You cannot rivet that support to stay. We have tried it by riveting—cold riveting—and we have put washers on top, and they will not stay. We have tested them in the vibrating machine and they work loose.

We have made tests and we have proven conclusively that the 2½ in. by 2½ in. by ¼ in. angle is not of sufficient strength. We have put wooden pins in the brake beams, applied the brakes and they just bent down.

It is unfortunate that this has been proposed as standard, because it is not generally applicable and it is not practical. In order to remove the spring plank you have to remove the supports, which is another menace.

Mr. Tatum: We found that on some cars the spring plank did not have a flange to rivet the loop to. The way we took care of that was to bend the flange over so it would come on top of the spring plank and could be riveted down through the spring plank to the end of the loop.

The point I want to make on the metallic steam connection is that we found that in about two and a half years the increased cost of the metallic hose would be taken care of if we consider the cost of maintaining the rubber hose. For that reason we put the metallic hose on our long trains.

Mr. Terwilliger: I recognize fully the advantages of the two-inch metallic connections. I know that it is impossible to heat the last car of even a ten car train in cold temperatures. My objection is based on the fact that these connections have not passed the experimental stage.

Chairman Smart: Since we first applied the metallic hose to our head-end cars three years ago, we have increased the number of cars that can be steam heated from ten to fifteen. In moderate winter weather we handle seventeen cars.

Mr. Purcell: I move the adoption of the report, and that the portion of it that is necessary go to letter ballot.

W. F. Peck (B. & O.): In connection with the paragraph entitled: "Changing Graduating Spring in Freight Triple Valves," I would like to suggest that the committee consider a method of marking such valves.

The B. & O. put in over 200,000 graduating springs. Several roads have been bearing this burden for the United States, namely, the Pennsylvania, the Reading, the Baltimore & Ohio, the Santa Fe, the Union Pacific, and the Southern Pacific, and I am not mentioning the private car lines which have had to put them in. I know that the Pacific Fruit Express has.

But where deadlines are established where cars must not pass without the heavy spring, there is no definite mark, and the men have moved the graduating stem nut to inspect the spring.

Mr. Burton: The point Mr. Peck raised has been considered by the Committee, and they did not believe that such marking was necessary. There is a double reason for it. The springs which are supposed to have been replaced have been standard ever since we have had A. R. A. triple valves, and we have railroaded and we are railroading with the older ones. It is true that they are removed in certain territories. We feel that where those deadlines are established, if there are such things, that they are the ones that should make the investigation, because it is for their benefit that we are asking everybody else to go along with them.

I might make one more statement in connection with Mr. Nystrom's remarks, because he apparently did not gather some things I said in reply to Mr. Porterman with reference to the bottom rod. He said that the brake beams could not be removed and replaced without cutting the supports off. My statement was based on extensive experience, and it is absolutely correct where two bars were used, but it is not true in any instance with which I am familiar where only one bar is used.

The statement was also made that one bar would not carry the brake beams in case of a failure of the hanger. That is not the committee's experience. It was made under the observation of one member of the committee. Some experimental cars weighing 54,000 lb. braking in accordance with A. R. A. recommended practice raised the brake pressure to 100 lb., making an emergency

application when the car is moved at a low speed, and we bent the brake beam before we bent the bars.

Another thing that I wish to again state, and I hope that you will bear it in mind, is that the Committee is not asking you to put on this bottom-rod support as shown in the report. The Committee is asking that you put one of equivalent strength, and that you should adopt it.

Mr. Nystrom: I would like to make an amendment to the motion that the portion of the report referring to the bottom-rod and brake-beam support be referred to the Car Construction Committee for further study, particularly in regard to strength requirements.

Chairman Smart: Will you accept the amendment, Mr. Purcell?

Mr. Purcell: Yes.

Chairman Smart: There is a motion with an amendment now before.

[*The motion was seconded and carried.*]

Railroading as a Career for College Men

College education should justify itself without asking odds—— Many graduates in service on those terms

By M. J. Gormley

Executive Vice President, American Railway Association

M. J. Gormley

Much has been said for many years about the failure of railroads to induce college men to enter their service. With every approach of graduation time the subject revives. It involves many questions the answers to which do not all appear in the statistics available. In attempting to analyze the subject, let us consider the following: Do the railroads want the college man in railroad service?

The answer to this question is plain and unequivocal. The railroads want the college trained man. They are constantly looking for the best talent that can be obtained, whether among college graduates, high-school graduates or representatives of the school which has been aptly termed "Knockabout University." They do not judge a man by the number of academic degrees he is privileged to write after his name. They judge him finally by his ability, initiative and willingness to work. The man who has a college education certainly may be expected to have an advantage over the one who has not, not only from the standpoint of his training in college to think clearly, to ascertain facts and base his judgment on them, but in the matter of prestige as well.

College Men in Official Railroad Positions Today

Comprehensive studies on the question are not many. Probably the most complete study that has been made is that of Mr. Kenneth F. Burgess, General Solicitor of the Chicago, Burlington and Quincy, which has appeared in the *American Economic Review,* issue for March, 1925. This study is based on the records of the general officers of 32 representative railroads, comprising 168,142 miles of line, or approximately 65 per cent of the total in the United States. The 32 roads were selected because their presidents or chairmen were members of the Executive Committee of the Association of Railway Executives. The officers included in the study were presidents, operating vice-presidents, general managers, traffic vice-presidents, freight traffic managers, general counsels, general solicitors and comptrollers.

The total of these officers was 204. Of that number 82, or 40.2 per cent held college degrees or had attended college for three years or more. As would be expected, the law-department officers had the largest percentage of college men—41 out of a total of 47, or 87.2 per cent. Next in order were the presidents—12 out of 33, or 36.3 per cent. In the case of operating vice presidents and general managers, there were 17 college men out of 49, or 34.6 per cent. Among the accounting-department heads there were 6 out of 29, or 20.6 per cent. The smallest proportion of college men was found among traffic vice presidents and freight traffic managers—6 out of 46, or but 13 per cent.

Analyzing the statistics from another viewpoint, it was found that the average non-college man entered railroad service at the age of 17.7 years and took 18.9 years to reach an official position at the age of 36.6 years. The average college man began railroad work at 23.4 years of age, nearly six years later than the average of the other group, but his promotion was so much more rapid that the college man reached his first official position at 36.8 years of age, almost identically the same age as the non-college man.

The Railway Age supplemented the figures gathered by Mr. Burgess by including the chief engineers and chief mechanical officers of the same railroads. It was found that 79 per cent of the chief engineers and 59 per cent of the chief mechanical officers were college men. With the addition of these officers, the total officers considered becomes 255, of which 118, or 47 per cent, were college men.

In the foregoing statistics, the term, "first official position" was taken as that of division superintendent, assistant general freight agent, general attorney, auditor in charge of a section of the accounting department, or an equivalent position.

These figures refute any statements that may have been made that college men are not given an opportunity to advance in railroad service. This study applies only to the general officers classification, and makes no mention of the lower official classifications. We have been unable to find any figures giving this same information for the division and lesser officers classification.

What Are the Opportunities of College Graduates?

According to reports made by Class I railroads to the Interstate Commerce Commission, there were 9,297 division officers, assistants and staff assistants in service in 1929, out of a total of 1,686,769 railroad employees. This group includes positions of division officers who have responsible control over the operation of a divi-

sion or a terminal or of a major activity within an operating division, and their assistants.

The college man entering railroad service has first ahead of him the opportunity to obtain one of the positions in this group. He must first go through this classification before he can reach the executive positions. Let us assume for the purpose of this study that he has no possibilities—except in rare instances—of going beyond the division officer class for at least 15 or 20 years.

Statistics as to the average turnover of men in these division-officer positions would be valuable as indicating the chance for obtaining them. Such figures are not available. For the purpose of completing the picture we will assume that the average tenure of these division officers is five years, although ten years would probably be closer to the actual situation. On the basis of a five-year tenure there would be 1,859 of these positions vacated every year, by promotion or otherwise. On the ten-year basis, 930 of them would become available annually.

In the higher executive positions there are a total of 7,698 officers on all railroads. The average tenure in these positions undoubtedly is more than ten years, but if we figure roughly on that basis it means that every year there are 770 of these positions vacated. This is not of immediate interest to the young man, because rarely are these positions obtained until after 20 years of railroad service. The figure is given merely to indicate the possibility of obtaining executive positions. Let us assume, then, that these two sets of figures indicate the possibilities for promotion.

The railroads have for a number of years been increasingly particular as to the class of men taken into their service. It is a fair assumption that practically all of the technical men in the engineering and mechanical departments are from colleges or have obtained the equivalent of a college education elsewhere. Likewise this is true of the legal department. Suggestion has frequently been made that the railroads should send recruiting officers to colleges for solicitation of men, as is being done by other industries. The railroads have passed beyond the rapidly expanding stage of a few years ago, considered from the standpoint of construction of new mileage. It is now a question of improvement and maintenance of a machine that has arrived at a point where its further expension will necessarily be very slow. Other and newer industries are still in the expanding stage and may, for that reason, have greater opportunities to offer the college graduate. With these facts before us, should the railroads send recruiting officers to colleges to obtain the services of college men? If the 165 Class I railroads adopted this practice we believe it would very quickly create the feeling in the minds of college men generally that a far greater prospect was being offered to the college graduate in railroad service than would actually result. The reaction from such over-inducement would be detrimental both to the railroads and the men.

Why Do Not More College Men Enter Railroad Service?

Why do not more college men enter railroad service and why do so many of them leave that service after a few years' experience? A brief answer to that question would be that they are too impatient of slow promotion and do not like the drudgery necessary in the initial stages of a railroad career. Another possible reason is that the diversified training which railroad service gives fits a man for almost any class of work in other industries, where the monetary compensation is possibly greater than in railroad service.

We had an experience recently with a college graduate who wanted to make railroading his life work. He seemed so interested in it and appeared to have all the qualifications necessary from the standpoint of education and personality that we aided him in getting a position in the operating department of a railroad. He was started on the right track, and from time to time we received favorable reports of his work. In less than a year he became a transportation inspector. Much to our surprise, a letter received from him later said that he would have to give up the position because he had to travel too much. We told him that if he were the president of the road he would have to travel a great deal. He could not stand the hardships of a railroad career.

The aversion of college graduates to entering work wherein they must pay all their attention for a few years to details, and do not have much opportunity to use the knowledge they have gained in college, is not applicable alone to the railroad business.

The bank does not differ from the railroad in its treatment of young men. They must go through the mill and prove themselves. Any man entering railroad service, whether a college man or not, and no matter how able he may be, cannot hope to receive any recognition in an official way during the first five years of his service. In most cases it would take at least that long to acquire the necessary detailed railroad education to fit him for even a minor official position. Perhaps the failure of college graduates to remain in railroad service would not be so large as it is if that fact were impressed upon them before they enter the service.

What Should the Railways Do About It?

What should the railroads do to obtain the services of more college men? What can they do? Frequently the suggestion is made that the railroads should hold out some special offer of advancement to the college student to induce him to cast his lot with them. It is argued in favor of such a plan that it has been successfully worked in some industries. But does it follow that that principle could with the same degree of success be applied to the railroad industry. We think not.

Weight must be given to the psychological factor. The morale of railroad employees is one of the most inspiring things in the industry. Ever since the railroads have been operating they have been thought of as offering advancement commensurate with service and ability. Generations of families have given their services to one railroad and they come to love it as a part of their life. I have seen men fight in resentment at disparaging remarks about their railroad. Can we afford to risk the destruction of that spirit by granting special privileges to any class of men? The question answers itself.

Then it is said that the time and effort which the student has expended in his four years at college entitles him to special consideration. But why? College is not an end in itself, but a means to an end. Presumably it fits a man to meet the problems of life and cope with them more successfully than his less fortunate brother. To the extent that any man can do that, he commands consideration, regardless of whether his ability comes as a result of college training, inherent brilliancy or whatnot.

Success is an elusive thing. About the only thing we can say about it is that it depends on the man. Certain it is that a college education is not an unfailing recipe for it. Our greatest universities cannot

make a success of an unwilling student, yet the man with inherent ability will succeed whatever the limitations have been on his education.

While a great deal of criticism of the railroads is made from time to time because of their failure to attract the college man, concrete suggestions as to how they should do this have not been convincing. Speaking before the New York Railroad Club at its meeting February 18, 1927, Professor W. J. Cunningham of Harvard University outlined a suggested plan for the formation of competitive groups of cadets each year, to be given general training which should fit them for executive positions. With reference to this plan, Professor Cunningham said:

> * * * * it would be unfortunate if the candidates were restricted to college graduates. Such a policy would antagonize the employees as a body, and would be resisted by the majority of officers. Within the ranks of any railroad there are many young men of great natural ability; men who were unable to go to college, but who have educated themselves in other ways, and who have even greater known promise that the untried college graduate. Such men should be discovered and encouraged.

Professor Cunningham realizes that the railroads can ill-afford to set up any plan for the training of prospective officers which would discriminate in favor of the college graduate. We think he overlooks a fundamental weakness of his plan, even though it includes non-college men. As we understand it, he would select a few promising young men from the ranks, add to them a few college men and make them cadets in training for executive positions. This could only be done with the knowledge among the employees that these men were selected for the purpose of becoming officers. What would be the effect of this on men who were not selected for this group? Naturally they would feel that their opportunity for advancement was limited by such a plan. With this impression prevalent, the selected men would have difficulty in securing the hearty cooperation of their co-workers, thereby making their success difficult of attainment. We believe it immediately would set up obstacles that are unnecessary in securing men of proper education for railroad officers.

If any railroad should establish the policy that only college-trained men could occupy positions of division officers or higher it would, in my opinion, find it necessary within a few years to abandon such policy and reopen the door of advancement to all men of initiative, ambition and perseverance. Such changing policy would be unjust, in the first instance, to the deserving non-college employee, and unfair, in the second instance, to the college employee who had been attracted by the prospect of preferential treatment. In either case the morale of the organization would be impaired.

Is a College Education Essential to Success?

Do the railroads need more college men? Does the college education necessarily fit the man for success? Some advocates of various proposals that railroads offer special inducements to college graduates to enter their service are so enthusiastic as to say, inferentially or otherwise, that the efficiency of railroad personnel will be greatly impaired if such steps are not taken. Our study rather controverts this. We find a great many college men among the present railroad officers. There is no reason to believe that the next generation will not show a correspondingly large percentage of railroad officers who are college-trained men.

No one would contend seriously that a college degree carries with it any assurance of success in after life. All education does not come from colleges. It is true, as a general rule, other things being equal, that the graduate has a better chance of success than one who has not attended college. Generally he can, or ought to be able to, express himself more clearly, either verbally or on paper, than the non-college man. We cannot squarely say, however, that this is solely due to the fact that he went to college. The same qualities which caused him to stick to school and make good marks might have pointed the way to success without the university training.

The social side of college life is sometimes stressed as being equally as important as the study of the various subjects. Possibly it is. The development of personality and the ability to meet people and deal with them is one of the most important things in life. To the extent that college life aids in developing these characteristics, it is invaluable. On the other hand, some people are endowed with a gracious personality; others simply do not cultivate it no matter how favorable an environment they may find.

Many young men today are working their way through college. The night classes offered by many of our universities make it possible for students to do office work all day and attend classes in the evening. The bulk of the social side of college is lost to these men. Yet when they graduate, they are, as a general rule, farther advanced than the regular students. They have had an opportunity to evaluate their school activities as they went along.

A man to be successful needs education, plus a well-balanced personality. The college graduate, we must assume, has the education. The first five years out of college are perhaps the most important period of his life from the standpoint of development of a balanced personality. During the four years of college he has lived in an academic and, to some extent, theoretical world. Upon his ability to fit himself in with the practical problems of whatever business he may enter depends his success.

Conclusion

The policy as to college graduates in railroad service is a matter for individual railroad determination. There are a number of questions in connection with it that can be answered and action determined upon only in accordance with the needs of the individual railroads. Some of them are as follows: (a) Is there a shortage of competent division officers today or a shortage of men already available for promotion to such positions? This can only be answered by the individual railroads; (b) If there is a shortage of competent men for promotion to officers, is it due to a lack of college graduates in the ranks; is it due to any antagonistic attitude on the part of non-college officers toward college men? If so, what is being done to offset such attitude? Is it due to unsatisfactory experience with the work of college graduates? These questions also can only be answered by the individual railroads.

It is doubtful if anyone can successfully deny that a lack of proper education is a distinct bar to progress. All railroad officers no doubt have seen employees who were natural leaders of men, competent in the particular work in their charge and who made wonderful progress up to a certain point and then failed of further promotion through a definitely indicated lack of the proper education necessary to handle a higher position. Possibly there is a failure on the part of railroad officers to point out to such men the necessity for improving their education. That, however, is admittedly a difficult thing to do and in many cases might not prove effective. In

the majority of cases the old saying applies: "It is difficult to help anyone who will not first try to help himself."

As a general proposition the most feasible plan would be to let it be known, first, that the railroad desires college men in its service, but that, second, every employee who has the necessary education, regardless of how it may have been obtained, will be judged according to ability and general fitness when promotions are to be made. Such plan should indicate definitely that the college man will have no preference merely on that account. Just as "virtue is its own reward," a college education should justify itself without asking odds.

Promises of any definite nature should not be made to college graduates or others as to what they may expect in the way of promotion in a certain period of time, for the simple reason that the failure, for whatever reason, is to make good on such promises would have a detrimental effect. Better results will be obtained in the long run by a policy of a free field and open door, with equal opportunity to all. It should be, if it is not now, the duty of division and other officers to be constantly in search of talent among employees for promotion to officer positions, and this regardless of whether they may come from college or elsewhere. Possibly it would be of value if an officer's individual progress were measured in some degree by his ability to develop officer material among the employees under his personal supervision.

All things considered, any college graduate today who is willing to start in railroad work upon graduation in the same position in which anyone would be required to start, and who approaches the field with a willingness to go through 15 years of hard work, will find that the rewards at the end of that period are as great in railroad service as in any other industry. They will be greater than in many industries.

Some statements have been made to the effect that the seniority rules of the railroads interfere with the promotion of men to officer positions. We do not agree with such statements. In the first place, seniority has no place in the appointment of officers, which is based entirely on the merits of the man, regardless of the avenue through which he has progressed. It is true that he may be in the seniority classes arriving at a certain point, but that does not bar him in any way from promotion to the official position.

It should always be remembered that the most important thing in a railroad career is to learn the art of dealing with your fellow employees in such a way that you have their confidence and are able to direct and handle them in the proper way when a position of authority is attained. The success of an officer depends more on this than on anything else.

Report of Committee on Wheels

Five changes in journal and wheel gages proposed ——System of symbols for wheel defects proposed

A. Knapp
Chairman

The committee in 1926 suggested the desirability of a gage to measure the length of worn journals and in 1929 presented a gage for adoption as recommended practice. At the same time it was suggested that the limit on journal length could apparently be increased without harmful results. We are now advised that this suggestion has received favorable consideration by the car construction and arbitration committees, and the permissible limit for freight-car journal length has been increased ⅛ in. As the maximum measurement on the gage proposed last year was 12½ in., it will be necessary to modify the journal-length gage slightly to meet this new condition. The committee has given this matter consideration and recommends that the slot in the top leaf of the gage be extended 3/16 inch, likewise the graduations on the bottom leaf. This change is illustrated in Fig. 1, with the recommendation that it be substituted in the next issue of the Code of Rules, in the Manual of Standard and Recommended Practice, and in the Wheel and Axle Manual at its next revision.

Several additional types of journal-length gages have been submitted during the past year and have received approval as acceptable alternates on the condition that in case of dispute the gage adopted as recommended practice is to govern. It is the opinion of the committee, however, that none of the other types of gages is preferable to the type adopted as recommended practice, either in first cost or accuracy, and particularly durability.

Increased Journal Length

The committee suggests that interchange rules 85 and 86, including column F in the table on page 114, be corrected to conform with the new condemning limit for journal length, if that has not already received attention. This change will likewise receive the attention of the committee, and Fig. 108 of the Wheel and Axle Manual will be corrected at the next revision of the manual.

Gages

Some of the gage manufacturers are hardening and plating all of the American Railway Association or recommended practice gages. This is a very desirable improvement and should be required for all gages, as we find that wheels which have considerable life in them are being condemned because of wear on gage-contact points. The hardening of the gages, however, requires that they be ground to finish sizes and checked with precision gages. This has resulted in some question regarding minor dimensions and the committee has made some changes in the drawing covering the tread and flange contour for cast-iron wheels, Fig. 62 of the Wheel and Axle Manual, also in Fig. 118 covering the standard mounting and check gage, to insure that gages will be constructed to conform to the desired check-gage distance, gage of wheels, and back-to-back spacing on the base line.

The committee recommends that the new drawings, presented as Figs. 1, 2 and 3, be substituted for Fig. 6-A in the interchange Rules, and Figs. 62 and 118 in the Wheel and Axle Manual, and inserted in the Manual of Standard and Recommended Practice as these rules and regulations are reprinted.

The attention of the committee has also been directed to the rapid rate of wear on the back contact point of the minimum flange-thickness gage for cast iron wheels, Fig. 61 of the Wheel and Axle Manual. This is due to the radius of 2 31/32 in. indicated at this point on the gage, whereas the radius of the back of the flange is 2⅝ in. The use of this particular gage has been continued to avoid scrapping a large number of gages for a minor feature, but it is recommended that as old gages are scrapped the new gages be purchased to a drawing on which a 2⅝-in. radius is specified. This change is illustrated in Fig. 4 and it is recommended that Fig. 4 be substituted for the present Fig. 61 of the Wheel and Axle Manual at its next revision and inserted in the Manual of Standard and Recommended Practice, correcting present page 41, Sec. B, of this manual. It is also suggested that Fig. 5 be substituted for Fig. 60 in the Wheel and Axle Manual and correcting page 42-A in the Manual of Stand-

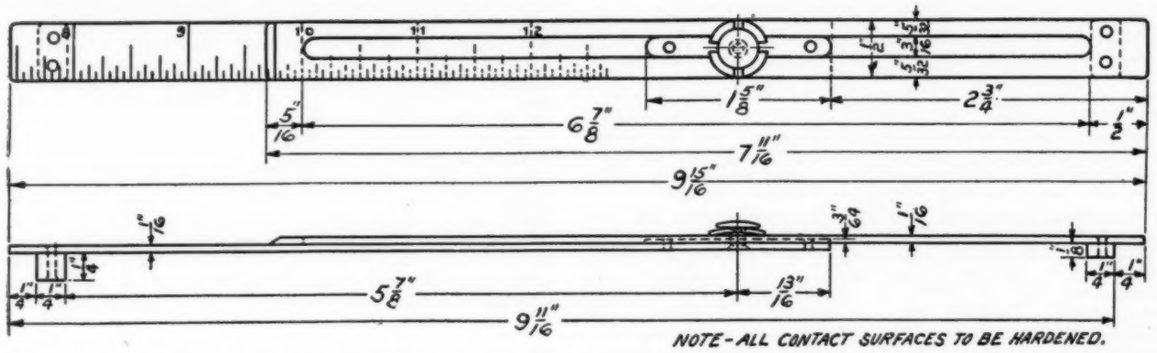


Fig. 1—Journal Length Gage for Measuring the Length of Journals on Class A to F Car and Tender Axles as per Paragraph 208 of A. R. A. Wheel and Axle Manual

ard and Recommended Practice to correct two minor errors in the present drawing.

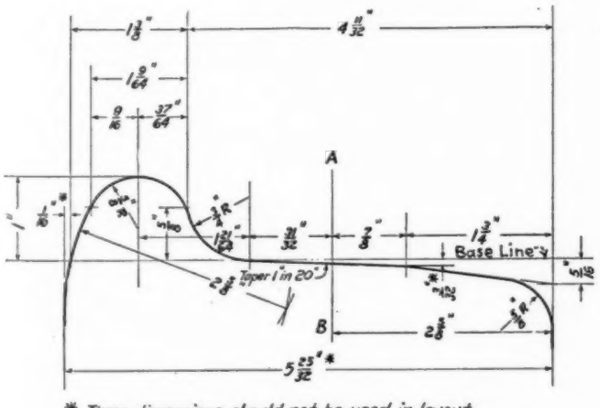
Steel and Steel Tired Wheel Tread and Flange Contours

The committee is frequently requested to decide upon the correct slope of the secondary chamfer on steel wheel treads, due to a difference between new and old drawings in the Manual of Standard and Recommended Practice. While it is a minor consideration, it leads to dispute between manufacturers and purchasers, and the committee recommends that all drawings involved be corrected to indicate the radius at the junction of the tread and front face of the rim as fixed by extending the slope of the secondary chamfer to the front face of the rim, the intersection of the line so extended to be 5/16 inch below the base line as shown in Fig. 6, page 18, of the Wheel and Axle Manual, and on page 50 (a) of Sec. D of the Manual of Standard and Recommended Practice. This necessitates modification of drawings on pages 50 and 51 of Sec. D, and Fig. 1, page 7, of Sec. F in the Manual of Standard and Recommended Practice. Fig. 2, page 7, of Sec. F should also be modified so that the dimensions in question will not exceed ¼ in.

The Wheel and Axle Manual

The committee is keeping in close touch with the Wheel and Axle Manual and finds that it is serving its purpose on many railroad systems. It is being used largely for reference purposes (20,550 copies have been distributed to date), and on one system it has been revised into an agency for promulgating instructions relating to wheel and axle practice.

The committee is accumulating additional material for the Manual, but will not suggest revision for another year or so. It is strongly recommended, however, that the Manual as written be given wider distribution. The committee encounters all too frequently unmistakable evidence of the reduction in wheel losses and the improvement in wheel and axle practice which is possible if the manual is properly distributed, studied, and enforced.



* *These dimensions should not be used in layout of contour. They are approximate and for information purposes only.*

Fig. 2—Tread and Flange Contour for Cast-Iron Wheels

For instance, practically all of the wheels reported loose and out of gage, and also trouble caused by this condition can be avoided if the recommendations are followed. Particular attention is directed to the importance of maintaining check-gage distances and to observance of paragraphs 247 to 251, inclusive, in mounting all types of wheels.

The distinction between various types of wheel defects should receive more attention not only on account of the importance of removal of defective wheels, but also on account of the loss involved in premature removal of serviceable wheels. Complaints are often made in regard to loss occasioned by delays to perishable goods. All too often these delays are brought about by condemning wheels close to or even at condemning limits. A large portion of this loss is unnecessary. Either the cars are leaving initial terminals with wheels at condemning limits, or the wheels are improperly condemned en route under the assumption that they will not run to destination. It is the unanimous and earnest recommendation of the Committee that wheels *in service* be permitted to run under all conditions until they *actually reach condemning limits.* When a wheel reaches any condemning limit, judgment should be used in selecting the point of removal. The type of defect should receive first consideration (see Section VI and Section XII in Wheel and Axle Manual); next, the distance to be run before the equipment will arrive at destination or at a convenient point for a wheel change. Another consideration is the appearance of the wheel itself, as generally this will indicate whether the rate of wear is rapid of slow, which, of course, would have a bearing on the mileage possible prior to serious reduction below condemning limits. Paragraphs 292 to 301, inclusive, of the Wheel and Axle Manual will aid in this determination.

Symbols for Wheel Defects

The committee has prepared two tables of symbols, one for cast-iron and cast-steel, and the other for wrought-steel and steel-tired wheel defects.* The symbols are based on interchange rule numbers and give a cross reference to interchange rules and figures and to paragraphs and figures in the Wheel and Axle Manual. In this table a symbol consisting of two figures and, in some cases, an additional letter will indicate the exact condition of the wheel reported, including the degree of development as well as the type of each defect.

The committee recommends that the table of symbols be submitted to letter ballot for adoption as recommended practice, so that it may become possible to bring about more accurate billing, better understanding of wheel defects through frequent reference to the rules and Wheel and Axle Manual, and a reduction in clerical work.

The assistance of the Arbitration Committee would be appreciated in the further development of the table, as it appears that slight modification of interchange rules may be necessary so that each type of defect may be referred to by a separate paragraph and identifying letter. The proposed symbols should be used in addition to the present descriptive terms for each defect for a period until they are thoroughly understood; then the symbols may entirely replace the inadequate terms and confusing systems at present employed on many railroads.

The symbols should be marked on the back plates of wheels at the time they are removed from service, so that the reason for each wheel removal may be checked by an experienced and capable wheel inspector upon arrival at the wheel shop.

*Detailed exhibits submitted as part of the committee's report cannot be included here on account of space limitations.—Editor.

Cast-Iron Wheel Specifications

The committee has met with representatives of the Association of Manufacturers of Chilled Car Wheels on two occasions during the past year and the cast-iron wheel specification and the service performance of the single-plate reinforced-flange wheels were thoroughly discussed. The committee is of the opinion that the specification for these wheels should not be revised until next year, as the manufacturers are engaged in important experimental work which may lead to extreme changes in the specification when the final results are available for study.

The manufacturers have requested the committee to consider a change in paragraph (c) of Section 2 of the present specification to aid them in their effort to produce a uniform chill of greater depth than the average wheel accepted under former specifications. This is a desirable improvement, as it will reduce, if not entirely eliminate, the worn-through-chill defect. The present requirement is that the depth of clear white iron shall not exceed ⅞ in., nor be less than 7/16 in. at the throat, and shall not exceed 1 inch, nor be less than ¼ in. at center line of tread, the blending of clear white and grey iron to be without distinct line of demarcation. The iron shall not have a mottled appearance at a greater distance than 1¾ in. from the throat or tread.

The introduction of lip type chillers has made it rather difficult to hold all wheels within the maximum of 1-in. depth of chill and 1¾-in. limit for mottle, and to avoid rejection it is the tendency to work to minimum limits, thus producing an undesirable quantity of low chill wheels.

To overcome this difficulty, the committee concurs in the opinion that the maximum depth of chill limit should be increased to 1¼ in. at the center line of tread and that the blending of clear white and grey iron should be without any distinct line of demarcation, without specifying a limit, the requirement that depth of chill shall not vary more than ¼ in. to remain as at present.

The introduction of the lip chiller has also led to some misunderstanding and rejection of wheels under paragraph (d) of Section 5, requiring that: "(d) If test wheel cracks with three blows or less, it will be considered as having failed." When this paragraph was inserted in the specification by the committee, it was intended to apply only to cracks in the plate of the former standard double-plate wheel. It is the opinion of the committee that this paragraph should be revised to read: "(d) If test wheel cracks in the plate with nine blows or less, it will be considered as having failed." The increase from three to nine blows is recommended in view of results of tests on the single plate wheel and to conform more closely to the requirement of twelve blows in Table II of the present specification.

There has been some discussion also regarding the height of drop for the 850-lb. wheel and it is recommended that the height of drop for this wheel be increased to 15 ft. to maintain a uniform increase in height of drop and increased wheel weight.

The foundry practice requirements recommended in the committee's report for 1928 to be included in the specification has been revised several times by the Manufacturers' Association, and the latest printed revision is dated October 23, 1928.

The manufacturers report a large increase in the orders for single-plate wheels, the records of the Manufacturers' Association indicating approximately 25,000 ordered for 1926, over 120,000 during 1927; over 460,000 during 1928 and over 2,325,000 during 1929, a total ordered at the close of 1929 of 2,930,000 wheels. At the rate they are now being ordered, it is expected the orders will total in excess of 3,000,000 wheels during 1930. This is encouraging information, as it indicates that about 25 per cent of the cast-iron wheels in service at the close of 1930 will be of the single-plate type.

Relations with Wrought-Steel Wheel Manufacturers' Technical Committee

The reports of wheel service received by committee members during the past year indicate a decided increase in the number of wheels removed on account of thermal checks in the treads. This is a dangerous defect, as explained in paragraph 35 of the Wheel and Axle Manual, for the reason that the checks develop rapidly at one or more points around the wheel rim into deep transverse cracks which greatly reduce the strength of the wheel rim. If the wheel has any inherent weakness, such as high initial stresses in the plate or pronounced physical or mechanical defects, a sudden fracture is liable to occur. In a wheel which is otherwise sound, the defect will develop into a radial crack through the rim, plate and hub, as explained in paragraph 35 of the Wheel and Axle Manual.

The number of wheels with thermal cracks is reported by various railroads as increasing rapidly. Some railroads, however, report that they have not as yet encountered this type of defect. This may be due to a difference in service conditions, but it is also possible that all the inspectors are not familiar with this particular type of defect. It is difficult to detect on wheels in trucks, but the committee recommends particular attention to all wheels showing signs of heating on the rims.

The turning of thermal checked wheels should also be given close attention, as the depth of the development varies and special precautions must be taken to avoid reapplication of wheels to service with traces of the checks or cracks remaining in the wheel rims.

The committee has had two meetings with representatives of the Wrought Steel Wheel Manufacturers' technical committee during the past year and this particular defect was discussed at

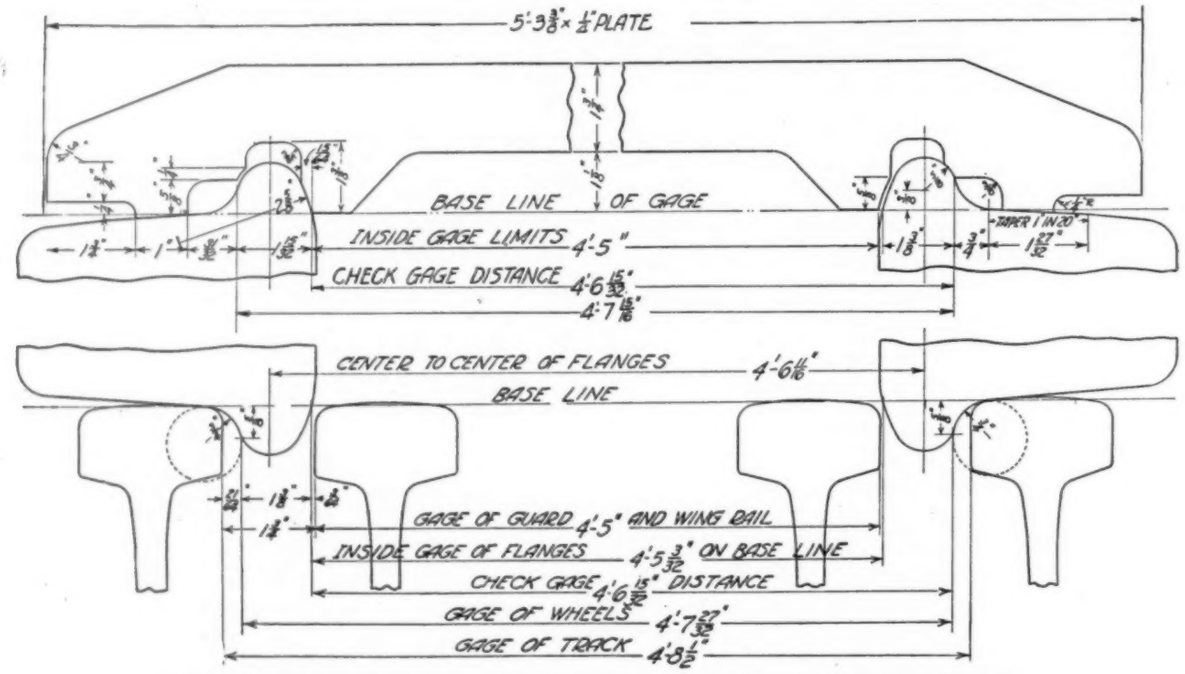

5'-3⅜" × ½" PLATE
BASE LINE OF GAGE
INSIDE GAGE LIMITS 4'-5"
CHECK GAGE DISTANCE 4'-6 15/32"
4'-7 45/64"
TAPER 1 IN 20
CENTER TO CENTER OF FLANGES 4'-6 11/16"
BASE LINE
GAGE OF GUARD 4'-5" AND WING RAIL
INSIDE GAGE OF FLANGES 4'-5 3/32" ON BASE LINE
CHECK GAGE 4'-6 15/32" DISTANCE
GAGE OF WHEELS 4'-7 27/32"
GAGE OF TRACK 4'-8½"

Fig. 3—Standard Mounting and Check Gage for Cast-Iron and Cast-Steel Wheels

length. The manufacturers were requested to appoint a sub-committee to co-operate with a sub-committee of the wheel committee to consider ways and means for elimination of this defect. The manufacturers have already commenced investigations to determine whether any change in either the chemical or physical properties of wheel steel will offer greater resistance to the changing conditions of service which produce thermal checks. The sub-committee of the wheel committee has been instructed to accumulate the information required and to co-operate in conducting service tests and in any other way possible to relieve the situation. The wheel committee also desires that the air brake committee appoint a sub-committee of two to aid in the proposed investigation.

A form is included with this report for use in compiling the information which seems to have a direct bearing on the problem.

The committee members will arrange to accumulate all the data

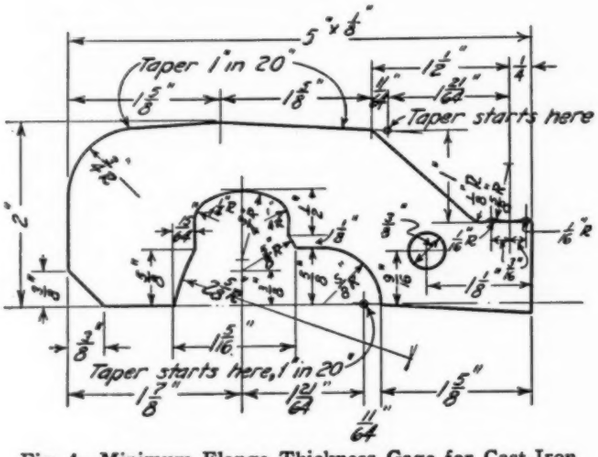


Fig. 4—Minimum Flange Thickness Gage for Cast-Iron Wheels

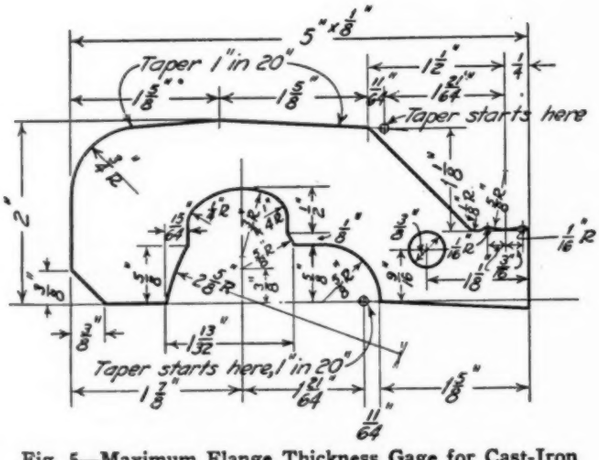


Fig. 5—Maximum Flange Thickness Gage for Cast-Iron Wheels

possible on the roads which they represent, and they would greatly appreciate similar information from any additional member railroad companies. The form recommended will be printed by the Association and furnished promptly as required upon application to the Secretary of the Mechanical Division.

The report was signed by A. Knapp (chairman), inspecting engineer, New York Central Lines; C. T. Ripley, chief mechanical engineer, Atchison, Topeka & Santa Fe; O. C. Cromwell, assistant to chief of motive power and equipment, Baltimore & Ohio; H. W. Jones, general superintendent motive power, Central Region, Pennsylvania; H. W. Coddington, engineer tests, Norfolk & Western; J. Matthes, chief car inspector, Wabash; C. Petran, supervisor tools and machinery, Chicago, Milwaukee, St. Paul & Pacific, and F. R. Callahan, superintendent of yards, Pullman Company.

Discussion

A. Knapp (N. Y. C.): The Committee is requested frequently to express an opinion as to the proper application of the remount gage specified in Rule 82 for inspecting second hand cast iron, cast steel or one wear wrought steel wheels. The question most frequently encountered refers to the top figure illustrated on Page 109 of the Interchange Rules.

The Committee has given this matter considerable thought and is of the opinion that the purpose of the rule and illustration is to establish limits beyond which it would not be equitable to allow wheels to be charged as second hand.

It will be noted that the radius on that portion of the gage which applies to the back of the flange is indicated as 2—31-32 in. and that the radius extends 3/8 in. above the base line of the gage. Also that the contact in the throat of the flange is 3/8 in. above the base line of the flange which clearly establishes the point of measurement as 3/8 in. above the base of the flange on a line parallel with the axis of the wheel.

If the gage is not applied caliper-wise but, on the contrary, is applied in a cocked position it would constitute an attempt to clear the gage and be contrary to the intent of Rule 82 in the Code of Rules and paragraphs 166, 167 and 168 in the A. R. A. Wheel and Axle Manual.

Our investigation of 54 pairs of cast iron wheel tread contours indicates that the number of wheels which would occasion any disagreement on this point would be very limited. The top figure indicating the application of the gage to determine flange thickness requires that face B of the gage rest on the tread to classify the wheel as unfit for remounting. It is obvious that the entire face B of the remount gage will not rest on a surface which is generally worn concave. The important point of contact is the base of the flange.

C. T. Ripley (A. T. & S. F.): The chairman has asked me to make a few remarks on several paragraphs of this report. The first one is in regard to condemning of loaded cars for what we may term non-dangerous defects. It is utterly ridiculous to cut out loaded cars of fruit simply because some inspector finds a wheel that will just take a vertical flange limit gage.

As far as the single plate wheel is concerned, your 7/8-in. vertical flange limit is very low, and the Committee is only waiting until the single-plate wheel becomes general until that limit is made one inch. To cut that wheel out when you can just barely get to 7/8-in. is ridiculous. It is contrary to the best interests of the railroads. It costs us money, and I would like to see some way worked out to overcome that. Unfortunately we have to have different rules in order to guide men who are on the job, but surely our supervising officers ought to be able to use some judgment and help the men in these cases. I do not refer in any way to the major defects, such as a cracked plate, or things of that kind. The two defects in which this trouble is most prevalent is vertical flange and thermal checks on cast iron wheels. This occurs more on some roads than others. All you have to do is to take your m. c. b. billing and go through it and you can spot the roads that are carrying this thing to extremes. I am for safety just as much as any of the rest of you, but somewhere along this line we have got to use judgment, and the supervising officers are the ones that are going to help in this matter. I hope somewhere through the rules we can work out a wording which will take care of the situation.

The next paragraph I wish to comment on is in regard

to the standard defect marking. That is a common sense system of marking defects, and I make a plea for all of you to at least consider adopting that system. Why not have one system and one that is tied up to the rule numbers, the rules being the things that the inspectors are most familiar with.

Next is the question of thermal checks on the wrought-steel wheels in passenger service. I do not want the impression to get out from this report that wrought-steel wheels are going down in quality in any way. There is no evidence to that effect whatsoever. It is simply a case of where we are speeding up trains, and we are increasing loads. We are making the service more and more severe, and we wish to work out some way of meeting that service somewhat better than we are today. But the problem is not one for the wheel manufacturers alone. There are other angles to it. I want to say that the sub-committee is giving those other angles just as much consideration as the wheel part of it. The brake shoe man is interested in this. The brake rigging man is interested in this. Why are brake shoes riding out on the outside of the wheel? The Wheel Committee is interested in it. Is their tread contour right?

Then again the operating man is interested in it. Are we handling braking on our heavy cars in such a way as to punish the wheels to a minimum? There is a big line for a story on this, so I merely want to leave the impression that all those angles are going to be considered.

(*A motion to accept those portions of the report not to be referred to letter ballot was carried.*)

Report of Committee on Car Construction

Progress on auto and steel-sheathed box cars——Clearances pending——Reduced center-plate height

A. R. Ayers
Chairman

In accordance with the practice of recent years the detail work of the committee on car construction has been handled by subcommittees, whose reports follow.

Drawings for Recommended-Practice Cars

Revised drawings for single-sheathed box cars of 40 and 50 tons capacity, double-sheathed wood-sheathed box cars of 40 and 50 tons capacity, steel-framed stock cars of 40 and 50 tons capacity, and steel hopper cars of 50 and 70 tons capacity, together with all details, are now shown in the supplement to the Manual.

Specifications for Journal Boxes

Recommendation from the Arbitration Committee to eliminate cast-iron journal boxes from the standards because of the susceptibility to failure in fair service has been considered.

It is recommended that the specifications for journal boxes A, B, C, D, E and F be revised by inserting after the words "cast iron" in paragraph one of the specification the words "when alloyed for proper strength and wearing qualities."

Grading Rules, Specifications and Patterns for Lumber

The Committee on Specifications and Tests for Materials will present proposed specifications and grading rules for lumber. This should be studied and criticisms or suggestions sent to the secretary to be considered in the further study of this subject.

The alternate lumber sections approved by letter ballot for trial for one year beginning March 1, 1929, have been before the members for over a year, but no conclusive information has been presented relative to any saving in price which might be effected by their use. This is being given further consideration.

Loading Devices—Automobile Cars

Attention is directed to the caution contained in the circular from the National Automobile Chamber of Commerce, revised December 5, 1929, that all clips, loops, stirrups, ring bolts, and similar loading and unloading devices should be of sufficient strength to withstand maximum strain.

Axle Loads—Interchange Rule 86

The fundamental purpose of Rule 86 is to make sure that axles are not overloaded. To accomplish this it is necessary to use the total weight on rail and the light weight of the car, as these are the only two figures that can be readily determined in ordinary service.

Total weight on rail is determined by adding the nominal weight of eight A. R. A. standard cast-iron wheels and four A. R. A. standard axles to the permissible load on journals, using the next lower even 100 lb. For a given load on journals, wheels heavier or lighter than A. R. A. standard cast iron will respectively increase or decrease the total weight on rail, which may be considerable.

The following table shows the total amount per car that axles are overloaded or underloaded for the various types of wheels indicated; for double-wear and multiple-wear wheels the figures are shown for new wheels and also for wheels worn to the limit:

40 TON WHEELS

Type	Under-loaded, lb.	Over-loaded, lb.
Cast Iron	180	
One-wear Cast Steel		452
Rolled Steel Single-wear		980
Rolled Steel Double-wear		420
Rolled Steel Multiple-wear	620	
Rolled Steel Double and Multiple-wear (worn to limit)		1380 approx.

50 TON WHEELS

Cast Iron	80	
One-wear Cast Steel		824
Rolled Steel Single-wear		1400
Rolled Steel Double-wear		840
Rolled Steel Multiple-wear	200	
Rolled Steel Double and Multiple-wear (worn to limit)		1800 approx

70 TON WHEELS

Cast Iron	544	
One-wear Cast Steel		1040
Rolled Steel Single-wear		1320
Rolled Steel Double-wear		920
Rolled Steel Multiple-wear	200	
Rolled Steel Double and Multiple-wear (worn to limit)		1800 approx.

The committee is not in position to make recommendations for corrections at this time, but will give it consideration with a view to making recommendations next year.

Stake Pockets for Flat Cars

Attention has been called to the necessity of providing a round edge at the bottom of the three sides of the stake pockets shown in the Manual, to prevent cutting wires, steel bands, etc., used to secure loads. This matter will be considered and a revised drawing to show a radius at the bottom edge will be submitted next year.

Designs of Recommended-Practice Cars

In the 1929 report statement was made that the limiting outline within which the committee had been designing cars had been referred to the Engineering Division to ascertain if it could be increased to permit of cars having greater dimensions for general interchange service.

The result of this check was inconclusive, and in view of the importance of the matter, the chairmen of the Engineering, Me-

chanical, Transportation and Traffic Divisions were requested to organize a special committee to decide upon further action. This was done and during subsequent meetings of the special committee it was decided that the Car Construction Committee should submit to the Engineering Division for general criticism a diagram for a car having 9 ft. 2 in. inside width and 10 ft. inside height, giving minimum outside dimensions to which such a car could be built.

It was further decided that after review of this diagram by the Engineering Division, a conference would be called with the Car Construction Subcommittee to harmonize the differences between the diagram submitted and the problems confronting the Clearance Committee, after which a questionnaire would be sent to all railroads inquiring as to restrictions necessary on such a car and their ability to handle equipment built to this outline; also what present equipment now exceeds the maximum shown on the diagram submitted, with outlines of such equipment. This will be followed to a conclusion and when the maximum permissible clearance diagram for general interchange service is agreed upon the designs of recommended-practice cars will be enlarged and modified to meet it.

The clear inside height of box and auto-box cars, especially the latter, is daily becoming of more importance, and during the past year your committee has given special consideration to this feature in order that the inside height may be made as great as possible within given clearance limitations.

With any given type of roof or floor construction a reduction in truck center-plate height will permit increasing the inside height a like amount without increase in clearances. In cases where the operation of a car may be restricted, perhaps over an entire division, because of clearance limitations, due to the presence of one or two "tight points," such as tunnels or other obstructions which are difficult and expensive to improve or remove, any reduction in over-all height may become of great importance in its effect on the general utility of the car.

The present standard center-plate height for all recommended-practice cars is 26¾ in. but it is entirely practicable to build trucks of 40, 50 and 70 tons nominal capacities having center-plate height of 25½ in., or 1¼ in. less than the present standard. In addition to the possible increase in inside height, this lowered truck height results in reduced center-sill stresses with a given area or construction, and opens up the possibility of some 400 lbs. reduction in weight, if desired, without exceeding the combined stresses now set up in the present structure and within the limits specified in the fundamental specification for design. There are now in use on American roads at least 300,000 freight cars built during and subsequent to 1918 with truck center-plate heights closely approximating the reduced figure referred to, some of which are equipped with trucks having cast-steel side frames meeting test requirements more severe than the latest A. R. A. specifications.

In view of this situation, your committee recommends the adoption of the 25½-in. center-plate height for all new and revised designs of recommended-practice cars. There is no intention of immediately changing existing car designs, this work to be deferred until drawings are completely revised to incorporate increased inside dimensions and certain minor changes now before the committee. Each of the various subcommittees on designs of recommended-practice cars have been requested to make a check in order to decide upon the best method to follow in accomplishing the proposed reduction in truck height.

In the meantime roads desiring to purchase cars to existing designs and at the same time to take advantage of the reduced truck height, may do so without inconvenience or loss of time by specifying construction in accordance with the existing drawings, but modified by the car builder, subject to the approval of the railroad company, so as to incorporate the reduced center-plate height feature.

Fundamentals of Design

Included in the 1929 report were complete specifications for fundamental calculations for the design of box cars, supplemented by an engineering specification and complete set of formulae and calculations for the 40- and 50-ton single-sheathed box cars, in accordance with drawings then in force. In view of the large amount of work involved, these calculations have not been revised to cover certain minor changes in construction subsequently agreed upon, and it is not the intention to attempt revisions to take care of possible future construction changes unless basic methods of calculation should become involved.

The engineering specification, formulae and calculations for the steel-frame single-sheathed car were submitted to illustrate the application of the specification for fundamental calculations and to be used as a guide in making calculations for other cars of similar type and design.

The report of the subcommittee is signed by C. R. Harding (chairman); P. W. Kiefer; K. F. Nystrom; A. H. Fetters and B. S. Brown.

Recommended-Practice Car Designs—Patents

The subcommittees on recommended-practice car designs in cases of designs of details which they may work up which are worthy of protecting will arrange for application for patents, so that such designs will be free for all car owners and car builders to use.

Single and Double-Sheathed Composite Box Cars

Designs of single and double-sheathed composite box cars has been completed and cars of the following dimensions are now shown in the Supplement to Manual:

	Single sheathed	Double sheathed
Length inside	40 ft. 6 in.	40 ft. 6 in.
Width inside	8 ft. 6¾ in.	8 ft. 7¼ in.
Height inside	8 ft. 7¼ in.	8 ft. 7¼ in.

The two designs of box cars that have been completed are for unrestricted operation, and over-all width and height dimensions may be increased when the matter of clearance is settled, and maximum dimensions within which cars may be designed for general interchange service have been decided upon.

The demand for box cars is for a single-sheathed composite car or double-sheathed steel car, and more thought will be given to the omission of double-sheathed composite car from Supplement to Manual.

Floors of box cars are damaged considerably and to better protect these floors consideration is being given to the application of intermediate floor stringers, located between center and side sill, extending from bolster to bolster, this intermediate stringer to be used in conjunction with 2⅜ in. flooring, the use of the 1¾ in. flooring being optional.

The report of the subcommittee on single and double-sheathed box cars is signed by O. S. Jackson (Chairman); J. Purcell; B. S. Brown and C. R. Harding.

Automobile Cars

The subcommittee appointed to prepare designs for automobile cars has not made much progress as the question of increased unrestricted clearance has been under discussion and it was thought best to hold up automobile car designs until this has been settled. This subcommittee will design an automobile car as large and high as possible as soon as the clearance diagram has been settled.

There is little demand for a double-sheathed composite car, nor one having a 10 ft. door opening. Therefore, consideration will be given in designing automobile cars, one with inside length of 40 ft. 6 in., the other inside length of 50 ft. 6 in., both having 12 ft. staggered door openings.

The same size center sill as used on the box cars will be applied to the automobile cars. The side framing for the single-sheathed car will be of the pressed-post type about the same as the present A. R. A. design for single-sheathed design. The other details, such as roofs, doors, trucks, etc., will be along the same lines as the designs worked up for single-sheathed box cars.

The report of the subcommittee on automobile cars is signed by O. S. Jackson and J. Purcell.

Stock Cars

The complete design for steel-frame stock car has been completed and the drawings are now shown in Supplement to the Manual.

The report of the subcommittee is signed by B. S. Brown.

Self-Clearing Hopper Cars

Instructions given your subcommittee were to design the 4-D (50-ton) and 4-E (70-ton) self-clearing hopper car as follows:

As many A. R. A. standards to be adhered to as possible.

Capacity to be figured on 52 lb. per cu. ft; weight of lading, making 2,500 cu. ft. for the 50-ton, and 3,000 cu. ft. for the 70-ton car, to be figured with an average heap of 10 in., to be as wide as adopted A. R. A. clearances will allow.

At the present time all detail and general arrangement drawings of these cars, including index and specifications, have been completed in accordance with approval given by letter ballot dated October 31, 1928, and are included in the supplement to the Manual.

In connection with the end construction of the car, license has been obtained from holder of patent covering narrow-end construction design. The design of narrow-end which was submitted and shown in the 1929 report will be shown as an alternate in the Manual.

The report of the subcommittee on self-clearing hopper cars is signed by W. B. Whitsitt (chairman), and B. S. Brown.

Refrigerator Cars

The design of an A. R. A. type refrigerator car has been tabled for the present on advice of the General Committee. However, the subcommittee is continuously active on fundamentals and details of refrigerator-car designs, and one railroad represented on the subcommittee has again ordered quite a number of steel-frame refrigerator cars built on the A. R. A. principle, and another road has ordered 900 cars to be constructed of a modified A. R. A. design with steel-frame superstructure with removable car body.

Consideration has also been given to reports of damage done to railroad property, apparently due to brine drippings. However, it is the opinion of your subcommittee that there has not as yet been submitted sufficiently definite information regarding damage from this cause to deserve any further consideration of the subject at this time.

The report of the subcommittee on refrigerator cars is signed by O. S. Jackson (chairman) and J. Purcell.

Steel Double-Sheathed Box Car

Your subcommittee appointed to prepare design of steel double-sheathed box car wishes to report that in a preliminary discussion it was agreed that some suitable existing design should be used as a basis for the new design, giving due consideration to the standard fundamentals already adopted. The nearest approach to such a car is the design first submitted in 1923, from which some 25,000 cars have been built. We believe all the members are more or less familiar with the construction of this car.

General Characteristics

Two roads are at present operating some 36,000 steel-sheathed box and auto-box cars each. Other roads have substantial numbers in service. During the past few years there has been an increasing tendency to build house cars of the all-steel wood-lined type. In view of this situation, it is possible that in the future greater numbers of the steel-sheathed cars may be built than any other A. R. A. recommended practice type. For this reason, it is proposed to include complete application drawings showing in each case one generally used and accepted permissible alternate for the important parts of the car, such as roof, corrugated end, corrugated door with all fixtures, floor construction, and perhaps some other applications. A general drawing will also be made to include these alternate constructions. In the preparation of these designs the best possible applications will be worked out, even though it may become necessary to deviate from certain major dimensions, such as length of center sill, length and width of roof or ends. For example, the end-plate offset used with flat-plate end applications will not be included in the design showing corrugated end application, but instead the corrugated end will be extended without offset up to the roof, which is in accordance with latest general practice.

General Dimensions

Center-sill length will be the same as for the single and double-sheathed cars with the flat plate end. Variation from this length may be found desirable with the corrugated end.

Inside length of car is to be 40 ft. 6 in., either with built-up or corrugated ends.

Inside width, 8 ft. 9⅛ in. It will be noted that this will make a wider underframe than used on the single or double-sheathed box car, but it is possible to use this width and keep within the A. R. A. clearance lines by following the general construction of the car in question.

The question of height of cars was discussed at some length, and it was agreed that we should make the inside height as high as possible to keep within the A. R. A. clearances.

Floor

The standard floor or deck is 2⅜ in. thick, and due consideration will be given to additional reinforcements for this floor when the design is worked up.

Lining

The lining will be shown as $^{13}/_{16}$ in. thick, with an optional provision for thicker nailing planks at certain locations, similar to that used in automobile cars. This can be obtained by using double thickness of lining or using heavy planks, notching the inner surface for the vertical posts.

Ends

Standard drawings will show built-up ends and separable top end plate, and provide for optional corrugated end. We are making some study of Z-bar corner posts in order to determine whether the same ends for the single and double-sheathed cars may be used for the car in question without detrimental effect on the design.

Since the question of clearance, which involves the present tentative clearance diagram according to which cars may be designed, is under consideration for revision, and the question of center plate height is also involved, your subcommittee, in accordance with instructions, will do nothing further in connection with preparation of drawings for this design until these matters are settled.

The report of the subcommittee on steel double-sheathed box car is signed by B. S. Brown, J. J. Tatum, P. W. Kiefer and J. McMullen.

Rail Motor-Car Axles

Owing to increased size and weight of self-propelled cars in railroad service, existing A. E. R. E. A. standard axle designs are inadequate to meet present day requirements, and in consideration of the increasing importance of the self-propelled car in railroad service, and the fact that car builders, electrical manufacturers, as well as street railway companies and other transportation organizations are vitally concerned, the question of axle designs suitable for application to this class of equipment has been given considerable study by subcommittees representing the American Electric Railway Engineering Association and committees on Car Construction and Automotive Rolling Stock of the Mechanical Division of the A. R. A.

At a joint meeting of the committees referred to, various designs of axles as developed by Rolling Stock Committee No. 1 of the A. E. R. E. A. and shown in that committee's report presented to the 1929 annual meeting were reviewed and various formulae used in the design of axles considered, resulting in the following tentative recommendations being made, pending results of further investigations:

E-9 Axle, Journals 5 in. by 9 in. Maximum capacity of 31,000 lb. to be retained as standard when used with 36 in. wheel.

E-9 Axle, Journals 5 in. by 9 in. Establish as recommended practice, maximum capacity of 32,000 lb. when used with 33 in. wheel. This capacity conforms with present A. R. A. standard for axles having this size journal.

E-10 Axle, Journals 5½ in. by 10 in. The maximum capacity of 38,000 lb. to be retained as standard when used with 36 in. wheel.

E-10 Axle, Journals 5½ in. by 10 in. Establish as recommended practice, maximum capacity of 40,000 lb. when used with 33 in. diameter wheel. This capacity conforms with present A. R. A. standard for axles having this size journal.

E-11 Axle, Journals 6 in. by 11 in. Proposed axle design to be set up as recommended practice.

E-12 Axle, Journals 6½ in. by 12 in. Proposed axle design to be set up as recommended practice.

E-13 Axle, Journals 7 in. by 13 in. Axles of this size not now considered necessary and further consideration of this design withheld.

Pending results of further investigations and final adoption of standard designs, axles as shown in Rolling Stock Committee report No. 304-1, modified in accordance with the foregoing, insofar as rated capacities of E-9 and E-10 axles are concerned, are to be used.

The report of the subcommittee is signed by P. W. Kiefer and B. S. Brown.

Truck Springs

This subject has been referred back to the subcommittee with instructions to prepare designs of coil springs, no special alloy, to meet present day requirements and to interchange with the space occupied by the present A. R. A. springs for 50- and 70-ton capacity cars and of greater strength than the present springs. The subcommittee is also instructed to look into the matter of improved spring plate design.

The report of the subcommittee is signed by S. B. Andrews (chairman) and W. O. Moody.

Definitions and Designating Letters for Freight Cars

No A. R. A. class symbols have been provided heretofore for freight cars used for handling pulpwood. Three different types are for the most part used in this service by various railroads, and it is for the purpose of providing suitable symbols for them that your subcommittee proposes the following symbols be inserted in the Manual in proper order alphabetically, under Classes "G," "F" and "L." The definitions clearly describe each car and make unnecessary accompanying cuts.

Class "G"—Gondola Car Type

"GP"—An open top car with solid bottom and fixed sides and ends surmounted by racks, and provided with side door openings. Suitable for handling pulpwood.

Class "F"—Flat Car Type

"FP"—Flat Rack. An ordinary flat car provided with side and end racks, with door openings in sides. Suitable for handling pulpwood.

Class "L"—Special Car Type

"LP"—An open top car having solid bottom and fixed sides and ends (either slatted or solid) and provided with side door openings. With or without running boards having guard rails. Suitable for handling pulpwood.

The report of the subcommittee is signed by C. E. Adams.

Journal Boxes and Journal-Box Lids

Your subcommittee on journal-box lids reports that considerable improvement has been noted this past year in the preparation of the lid face on journal boxes—both the separable type as well as those cast integral with the truck side frames. Manufacturers of lids also have improved their design so that lids fully meeting the requirements and intent of the specifications adopted last year are now on the market and may be purchased at reasonable prices.

The present design of journal boxes C, D, E and F, does not provide sufficient clearance under the holding lug to allow for the lid to have a ¼ in. projection at the top. (See paragraph 4-h of Lid Specifications.) We submit herewith a revised design that will correct this feature, and at the same time provide a small ledge on top of the box to prevent water or oil washing dirt or foreign matter into the box.

We also recommend that the specifications for all journal boxes be changed to eliminate the use of cast iron, and substitute the following:

Cast iron, when alloyed with other metals to secure proper strength and wearing qualities.

An additional paragraph should also be inserted in these specifications as follows:

Hole for lid pin must be horizontal and also parallel with the lid face of the box.

The report of the subcommittee is signed by C. L. Meister and S. O. Taylor.

Journal Wedges and Gages

In accordance with instructions, we have redrawn journal-wedge gage shown on page 22, Section B.

As the detail of the wedge has been eliminated and also dimensions showing tolerances have been removed from this page, no changes have been made in the gage with the exception that the dimension *Q* has been uniformly changed for all wedges to ¾ in. and note has been added on this drawing reading as follows:

Tabulated dimensions are gage dimensions and are the maximum and minimum allowed, using tolerances shown under permissible variations, page 25, Section D.

Journal bearing wedge has been redrawn on account of dimension *Q* being uniformly changed to ¾ in. for all wedges.

The permissible variations formerly shown on 22, Section B have been transferred to this drawing so that the nominal dimensions and the permissible variations are shown together.

No other changes have been made in this drawing.

The report of the subcommittee is signed by K. F. Nystrom.

The report of the Committee on Car Construction is signed by A. R. Ayers (chairman), general manager, New York, Chicago & St. Louis; P. W. Kiefer, vice-chairman), chief engineer motive power and rolling stock, New York Central; O. S. Jackson, general superintendent motive power and machinery, Union Pacific; C. L. Meister, mechanical engineer, Atlantic Coast Line; J. McMullen, superintendent car department, Erie; John Purcell, assistant to vice-president, Atchison, Topeka & Santa Fe; W. O. Moody, mechanical engineer, Illinois Central; C. B. Smith, engineer of tests, Boston & Maine; S. O. Taylor, master car builder, Missouri Pacific; W. A. Newman, chief mechanical engineer, Canadian Pacific; C. S. Goodwin, assistant general superintendent motive power, Chicago, Rock Island & Pacific; J. J. Tatum, general superintendent car department, Baltimore & Ohio; E. B. Dailey, engineer car construction, Southern Pacific; B. S. Brown, assistant engineer, Pennsylvania; K. F. Nystrom, superintendent car department, Chicago, Milwaukee, St. Paul & Pacific; J. P. Laux, superintendent motive power, Lehigh Valley; and S. B. Andrews, mechanical engineer, Chesapeake & Ohio.

Discussion

A. R. Ayres (N. Y. C. & St. L.): As to the lumber proposition, in addition to what is in the report, the outstanding feature of the whole matter as far as the Mechanical Division is concerned, seems to be this: The lumber manufacturers, as an association, have felt that if we could revise our standard sizes so that they could be cut from standard rough sizes, it would be advantageous to everybody. One of their criticisms about the former standards is that it takes different rough sizes to make the same finished size. For example, if you cut a 5¼-in. piece lath, it takes a wider rough piece than it does to cut a 5¼-in. piece from common growth.

One of the elements proposed is to make the design such that they can both be cut from the same rough size. This committee has been endeavoring to develop just what reduction in price the railroads might obtain if this matter was carried through, and until recently we have not been able to get very far. The situation seemed to be that the West Coast lumbermen were able to quote some lower prices, at least in some instances, but we were not able to get very much out of the Southern Pine people, the result being that the people who used large quantities of Southern pine did not think that there was much in the proposition, but some others that used more Western lumber thought they might make a saving.

The principal matter that I wanted to put before you for consideration is that the Southern Pine Association has passed a resolution which is virtually, if not exactly, the same as one that was passed by the Western lumber people. I will just read the last paragraph of it:

"Be it further resolved that if the American Railway Association will adopt the sections recommended by the Mechanical Division as standard, the Southern Pine Association will feel free immediately to promulgate it as the standard of manufacture for its subscribers with the conviction that in the production and use of these sections there will result a lower cost in the construction and repair of railroad cars."

The question is as to whether these alternate designs shall go another year as recommended practice, or whether they should be adopted as standard. That resolution tells you what the Southern Pine and the West Coast lumbermen think of the proposition.

This has not been acted upon by the committee as a whole. It is just some information that developed after the report was written.

Chairman Smart: I think we started off on the wrong foot when we had grades of lumber with the tongue and groove offset, and widths of lumber that you could not get out of commercial widths of lumber and have the proper moisture content.

These are the things you probably have been turning over in your minds. On some roads you may have been using this new standard. Personally I can say that on the Canadian National we are using a new standard of lumber, and we have not regretted it.

Mr. Swilley (Fruit Growers Express): I represent a private car company that uses a great deal of lumber, and we have gone into this question regarding the alternate section lumber rather whole-heartedly. Our lumber comes mostly from the West coast and our company has been able to show some little saving.

There is another condition in regard to the economy of it. We feel that in an emergency we can go out to a lumber yard and buy the pieces of material required—the siding, and lining, and flooring. These materials are used generally in the building trade, and we have been able to effect some little economy and help ourselves out in an emergency by reason of that fact.

Mr. Purcell: *I move that we accept the report. With the understanding that the portion of the report referring to center-plate height will not be submitted to letter ballot, as the committee wishes to consider it further.*

[*The motion was seconded and carried.*]

Mr. Ayres: In regard to the lumber sections, as the matter stands now, there does not seem to be any recommended action as to whether these sections should continue as recommended practice, or whether they should be adopted as standard.

The Car Construction Committee did not make that recommendation in this report because we did not know enough about it at that time to make it. I am inclined to think that that would be a very justifiable procedure at this time to submit to letter ballot the question of whether the sections will continue as an alternate, or whether they should be adopted as standard.

Chairman Smart: We voted on the question, and with that as an amendment I will ask you to vote as if it is considered as a portion of the main motion.

(*The amendment was voted upon and carried.*)

Report On Couplers and Draft Gears

Outstanding report proposes specifications for approved draft gears—type E coupler—swivel and radial butt couplers

R. L. Kleine
Chairman

The committee submits its report to the 1930 convention in three sections, with the recommendations that:

Draft Gears—(a) The specifications for approved draft gears for freight service; (b) Certificate of approval for draft gears; (c) Purchase specifications for approved draft gears for freight service; be submitted to letter ballot for adoption as recommended practice.

Followers—The specifications for separate followers be submitted to letter ballot for adoption as recommended practice.

Type E Coupler—The Type E coupler be submitted to letter ballot for adoption as recommended practice. Plates A, B, C, D and E.

Swivel and Radial Butt Couplers—This covers a report of progress. The sub-committee will continue its studies and follow up the tests in service with a view of making a definite recommendation at the next annual meeting.

Your committee wishes to acknowledge the hearty cooperation they have received from the draft gear manufacturers in the formulation of the draft gear specifications. The association is indebted to the coupler manufacturers for the further development of the Type D coupler and testing of the improved design, termed the Type E coupler, which development involved careful study over a period of years and considerable expenditure in completion and testing out of the design.

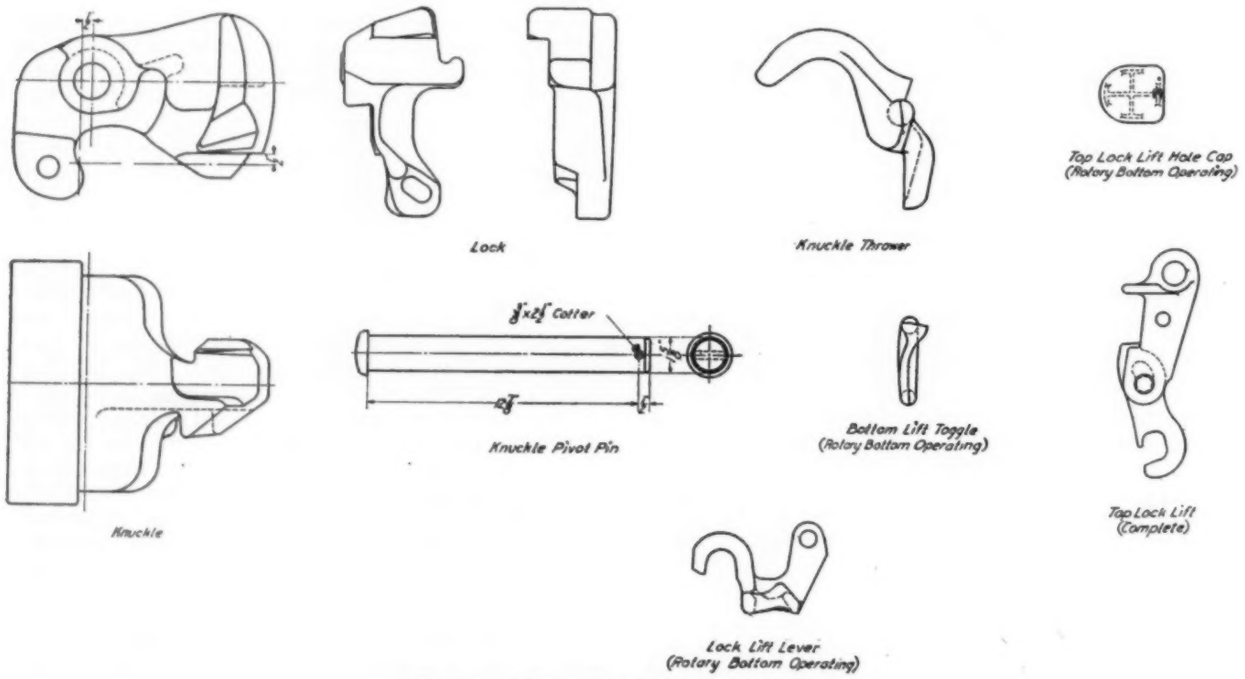
The report was signed by: R. L. Kleine (chairman), assistant chief of motive power, Pennsylvania; C. P. Van Gundy, engineer of tests, Baltimore & Ohio; C. J. Scudder, superintendent motive power and equipment, Delaware, Lackawanna & Western; H. W. Coddington, engineer of tests, Norfolk & Western; C. B. Young, consulting mechanical engineer, Chicago, Burlington & Quincy; Samuel Lynn, superintendent rolling stock, Pittsburgh & Lake Erie; L. P. Michael, mechanical engineer, Chicago & North-Western; E. A. Gilbert, general master car repairer, Southern Pacific; M. A. Hall, superintendent machinery, Kansas City Southern.

Report of Sub-Committee on Draft Gears

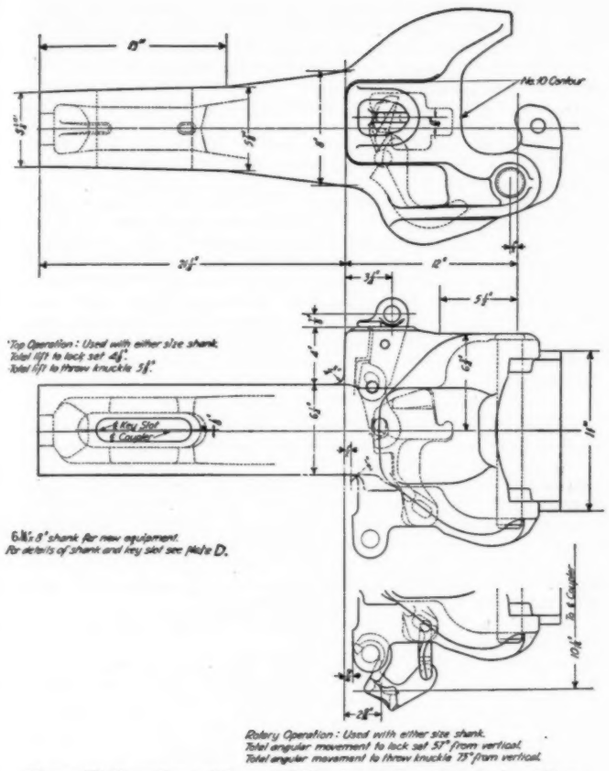
Following the annual convention last year the tentative specifications were submitted to the manufacturers for criticism. Replies were received from all manufacturers and careful consideration was given to all criticisms and suggestions offered.

Revised specifications were then prepared and these also were submitted to all manufacturers. Later a joint conference was held with the main committee and the representatives of the manufacturers, at which all differences of opinion were frankly discussed. As a result of this meeting, some further changes were made in the specifications and the final result is that the specifications for approved draft gears for freight service submitted herewith (Exhibit A) are believed to be fairly satisfactory to all concerned.

Some exception has been taken to the limit for recoil em-

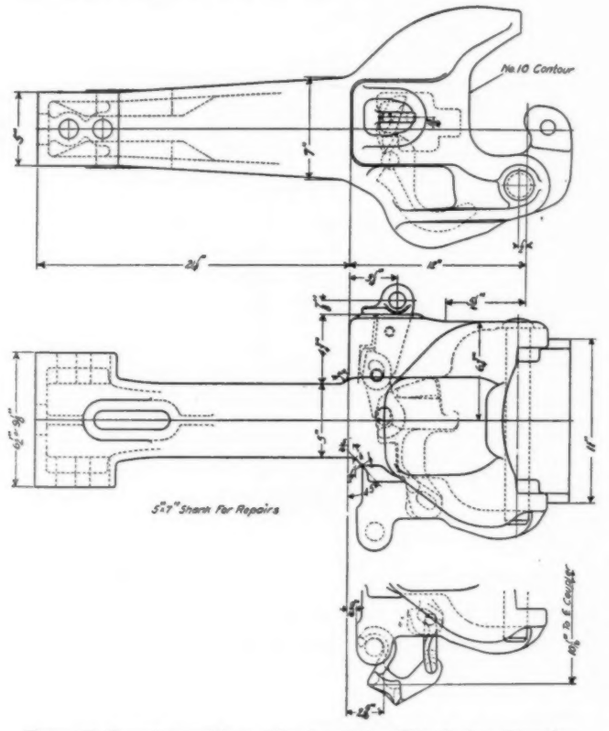


Details of Type E Coupler Knuckle Parts


No. 10 Contour
Top Operation: Used with either size shank.
Total lift to lock set 4¼".
Total lift to throw knuckle 5¼".
E Key Slot
E Coupler
6¼" x 8" shank for new equipment.
For details of shank and key slot see Plate D.
Rotary Operation: Used with either size shank.
Total angular movement to lock set 57° from vertical.
Total angular movement to throw knuckle 75° from vertical.

Type E Coupler with a 6¼-In. by 8-In. Shank for New Equipment

bodied in these specifications (Sec. 11), but your sub-committee is not yet convinced that any modification of this important requirement is warranted. Arrangements are being made, however, for a series of impact tests and, if necessary, road tests. If the results indicate that a greater percentage of recoil may be permitted, the specifications will be changed, if possible, before submission to letter ballot.

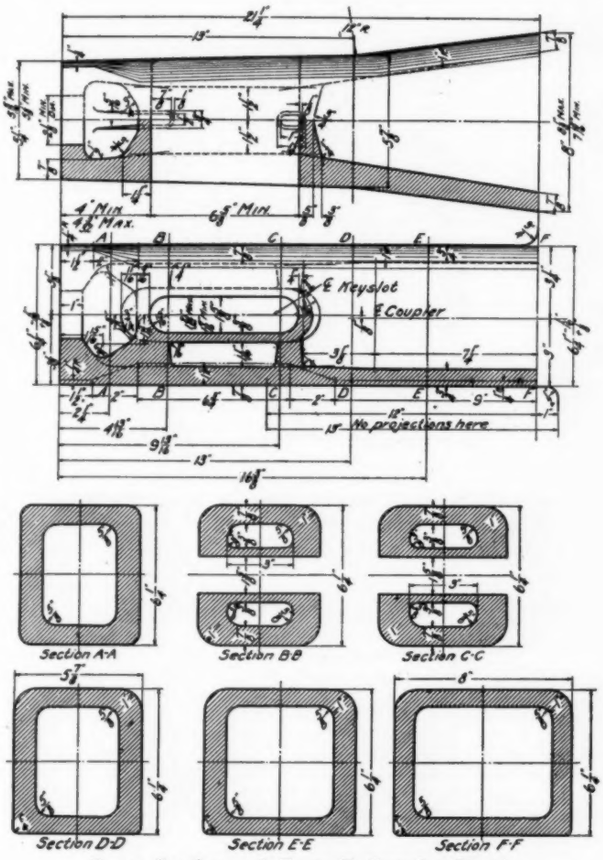


Type E Coupler with a 5-in. by 7 in. Shank for Repairs

Your sub-committee has also prepared and submits herewith a proposed set of instructions regarding certificate of approval for draft gears (Exhibit B) and also a proposed form of certificate of approval for draft gears (Exhibit C).*

Briefly stated, the proposal is to limit any future applications of freight car draft gears to A. R. A. approved types. Any manufacturer may submit one or more types for approval. Tests will be made at the expense of the manufacturer under the supervision of your sub-committee in the A. R. A. laboratory at Purdue University. A certificate of approval will be issued for each type of gear which meets the requirements of the specifications. These certificates will be good as long as no change is made in either the design or material of the gear, or in the specifications.

It should be understood that no obstacles will be placed in the way of development of new and improved types of draft gears. In Sec. 1 of the proposed specifications it is specifically stated that they cover draft gears for freight cars and locomotives "having the A. R. A. standard pocket."



Cross Sections of Type E Coupler Shank

In order that the purchaser of approved draft gears may be able to ascertain for himself that gears furnished are up to standard, secondary specifications have been prepared which are designated as Purchase Specifications for Approved Draft Gears for Freight Service (Exhibit D).

These purchase specifications provide for abbreviated tests to be made under either the 9,000- or 27,000-lb. drop hammer. They may be made at the manufacturer's own laboratory or that of the railroad, as may be agreed between the manufacturer and the purchaser.

Separate Followers

It has been found that the material used by most railroads for draft gear follower plates is low carbon steel or wrought iron. Such material is too soft for this purpose, especially when used with certain types of draft gear which utilize the followers to provide part of the friction capacity.

Therefore, it is recommended that when separate followers are used with friction draft gears they shall be made from carbon steel and conform to the chemical and physical requirements of

*Not reproduced here.

the A. R. A. specifications for axles, shafts and other forgings, Class A unannealed (Manual, Section A, pages 7 to 10, 1926). The size of the followers shall be 12½ in., plus or minus ⅛ in., by 8⅞ in., plus or minus ⅛ in., by 2¼ in., plus or minus 1/32 in.

It is further recommended that shearing of followers be not permitted. They shall be smooth forged or sawed.

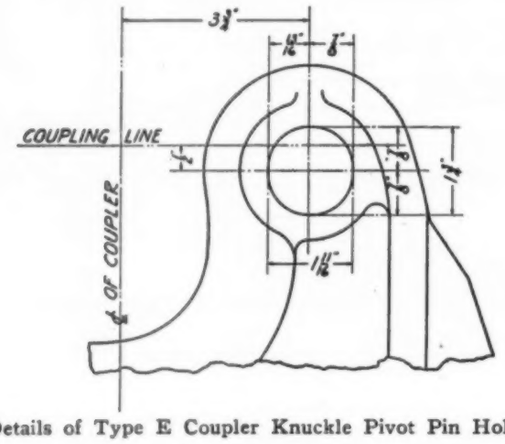
The sub-committee report was signed by H. W. Faus (chairman), C. B. Young, H. W. Coddington, H. I. Garcelon, and L. H. Schlatter.

Exhibit A—Specifications for Approved Draft Gears for Freight Service

Scope—These specifications cover draft gears which will be approved by the Coupler and Draft Gear Committee for freight cars and freight locomotives having the A. R. A. standard pocket.

I. Manufacture

Material—Manufacturer shall furnish information as to the physical and chemical properties of all materials used for each part of the type of gear submitted for approval under these specifications. Thereafter no change in materials will be permitted without advice to the Association in order that decision may be made as to whether new certificate of approval is necessary.



Details of Type E Coupler Knuckle Pivot Pin Hole

Dimensions—(a) The outside measurements of the gear shall be such that, with the necessary followers, it may be applied in the A. R. A. draft gear-pocket, 9⅛ in. by 12⅞ in. by 24⅝ in. The width and depth given are maximum dimensions. The length is a minimum dimension which the follower and gear, when fully released, should slightly exceed.

(b) The travel of the gear shall be not less than 2½ in., nor more than 2¾ in.

(c) The solid height of the gear and followers must not be less than 21⅞ in. This will be measured with the gear under load in the drop-test machine.

(d) Coil springs must not go solid before the gear goes solid even if the oversolid parts of the gear should shorten ¼ in.

Marking—Markings shall be cast on cast casings or stamped on forged casings in such location that they are not subjected to wear and, if possible, where they can be readily seen without removal of the gear from the car. These markings shall be as follows:—name of manufacturer, type designation of gear, letters "A. R. A." followed by date of issue or re-issue of these specifications to which they conform, and month and year of manufacture.

II. Inspection and Tests

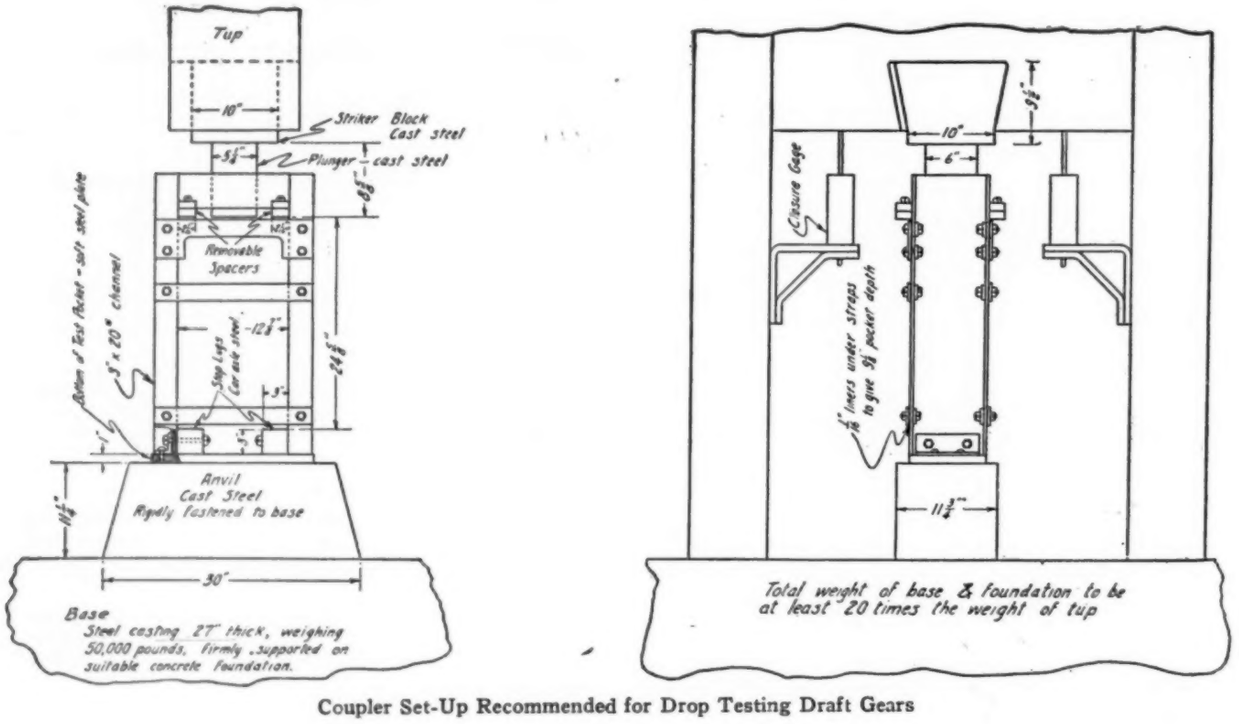
Specimens—Six gears shall be selected in accordance with published regulations. This supplies one alternate gear as provided for in the test procedure.

Inspection—(a) The six gears shall be measured, both assembled and disassembled. Hardness determinations shall be made on parts having a specified hardness. Condition of friction surfaces shall be noted. Coil springs shall be given a static test to closed height. Weights of parts shall be determined and recorded. In order to pass this inspection the gears must show agreement with the manufacturer's blueprints.

(b) All parts shall be numbered to insure their being reassembled in their original positions.

Test Set-Up and Definitions—(a) In order to eliminate the effects of atmospheric conditions as much as possible the testing laboratory should be in a building having a uniform temperature and the gears should stand in this laboratory at least 24 hours before being tested. The friction surfaces shall be protected from moisture, grease, dust, etc.

(b) All tests shall be made under the A. R. A. 27,000-lb. drop test machine. The anvil of this machine is supported on a rigid foundation and the gears are placed in pockets which rest upon the solid anvil and are designed to hold the gear to normal length, the regular complement of followers being used as in service. Fig. 1 shows the pocket and test set-up which is used. The followers shall be the A. R. A. standard forged followers, 8⅞ in. by 12½ in., except that they shall be machined on one side only to give a uniform thickness of 2¼ in. The unfinished surface shall be placed next to the gear in testing. The friction elements of the gear shall be turned up or down according to the recommendation of the manufacturer.



Coupler Set-Up Recommended for Drop Testing Draft Gears

(c) In order to prevent objectionable heating of the friction surfaces, no gear shall be subjected to more than 100,000 ft. lb. of work in any half hour. All work applied shall be computed on the basis of free fall of the tup.

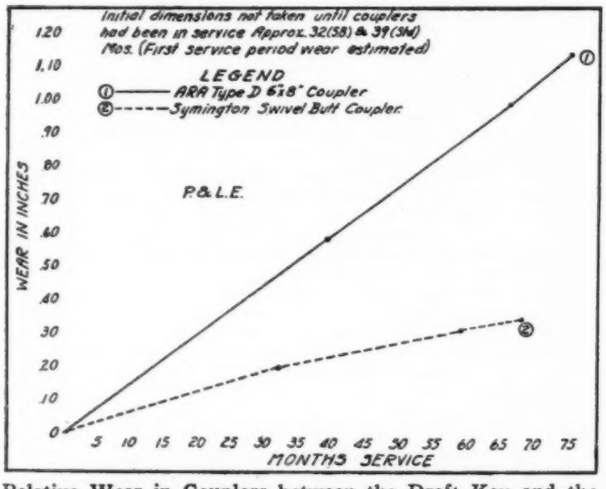
(d) The datum line for determining free fall of the tup and closure of the gear shall be established by lowering the tup until the plunger in the test pocket is barely loose.

(e) The solid point of a gear shall be determined by the use of lead records if possible. These records shall consist of small pieces of 1/16 in. sheet lead not exceeding ⅛ in. in width or lead wire ⅛ in. in diameter. They shall be inserted at four points approximately equidistant, where the construction of the gear will permit. A gear will be considered as solid when any two lead records are sheared or flattened to a thickness of 0.01 in., unless it has been determined that some other part of the gear goes solid before this point is reached. In this latter case, the solid point will be considered to be where the parts first went solid. If lead records cannot be used, the solid point will be determined by any other approved method.

(f) The solid height of a gear and follower will be computed from data secured on a blow just before the gear goes solid. Subtract the sum of height of plunger, thickness of bottom of test pocket, thickness of lead record, and gear travel from height of tup above the anvil when in datum position.

(g) The closing height of a gear is the free fall of the tup which just closes the gear.

(h) The capacity of a gear is the weight of the tup in pounds multiplied by the total fall in feet which closes the assembly of the gear and followers to a length of 21⅞ in., or to the solid point of the gear should this be greater than 21⅞ in.


Initial dimensions not taken until couplers had been in service Approx. 32(SB) & 39(SM) Nos. (First service period wear estimated)
LEGEND
① ARA Type D 6x8" Coupler
② Symington Swivel Butt Coupler
P.&L.E.
WEAR IN INCHES
MONTHS SERVICE

Relative Wear in Couplers between the Draft Key and the Front Follower as Established on Eight Pittsburgh & Lake Erie 70-Ton Hopper Cars—Four Cars Equipped with Each Type of Coupler

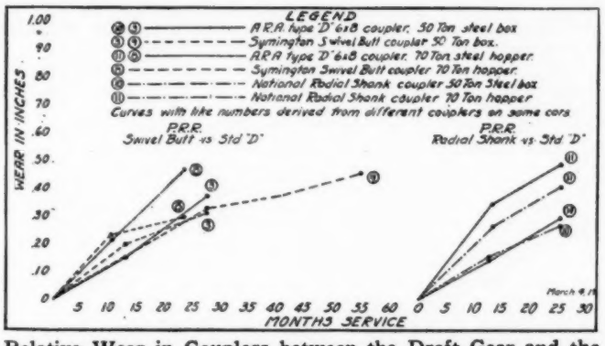
(i) The recoil of a gear is the height above the point of maximum closure which the tup reaches on the first rebound, expressed as a percentage of the total fall of the tup. When measuring recoil close to the solid point of a gear caution should be used, as the effect of the gear going slightly oversolid is very great.

Preliminary Test—Each of five gears shall be given approximately 200,000 ft. lb. of work as follows. Make a closure test by starting at 1 in. free fall of the 27,000-lb. tup and continue with 1-in. increments until the closure is within ½ in. of nominal total closure, use ½-in. increments until the closure is within ¼ in. of nominal total closure and then use ¼-in. increments until the gear is solid, or until it receives 200,000 ft. lb. of work. If the gear has not received 200,000 ft. lb. of work in this closure test continue to make drops from a height ½ in. under the closing height until the total work received is as close as possible to 200,000 ft. lb.

Capacity Test—(a) The capacity of each of the five gears will be determined by a closure test made as follows: Start at zero free fall of the 27,000-lb. tup, continue with ½-in. increments until the closure is within ¼-in. of nominal total closure and then use ¼-in. increments until the gear is solid.

(b) A chronograph curve shall be secured for each blow made. Gear reaction and recoil shall be determined from these curves.

(c) In order to pass this test satisfactorily a gear must have a minimum capacity of 18,000 ft. lb. The capacity at half travel should not be less than 25 per cent, and shall not be less than 20 per cent, of the capacity at full travel.


LEGEND
A.R.A. type D 6x8 coupler, 50 Ton steel box
Symington Swivel Butt coupler 50 Ton box.
A.R.A type D 6x8 coupler, 70 Ton steel hopper.
Symington Swivel Butt coupler 70 Ton hopper.
National Radial Shank coupler 50 Ton Steel box
National Radial Shank coupler 70 Ton hopper
Curves with like numbers derived from different couplers on same cars
P.R.R. Swivel Butt vs Std 'D'
P.R.R. Radial Shank vs Std 'D'
WEAR IN INCHES
MONTHS SERVICE

Relative Wear in Couplers between the Draft Gear and the Front Follower as Established on Pennsylvania Steel Box and Hopper Cars

(d) If the capacity of not more than one of the five gears is less than 10 per cent under the prescribed minimum of 18,000 ft. lb. there may be submitted in its place an alternate gear which shall also be given the preliminary and capacity tests.

(e) The gears shall be considered as having satisfactory capacity if:

1. All gears meet the requirements.
2. At least four of the first five gears tested meet the requirements, the other gear does not fall more than 10 per cent below the requirements and the alternate gear tested meets the requirements.

If these conditions are not met, the gears will not be acceptable.

(f) The gears passing the capacity test shall be subjected to further tests as hereinafter specified.

Reaction—(a) While a high maximum capacity is desirable, yet it should not be secured by too high gear reaction. Any gear which shows more than 27,000 ft. lb. capacity should be viewed with suspicion until it is established that its reaction is not undesirably high in relation to its capacity.

(b) At the present time the chronograph is believed to be the most reliable instrument for measuring gear reaction, but owing to the degree of accuracy and skill required to obtain dependable results, it is not as yet considered desirable to reject gears on this basis.

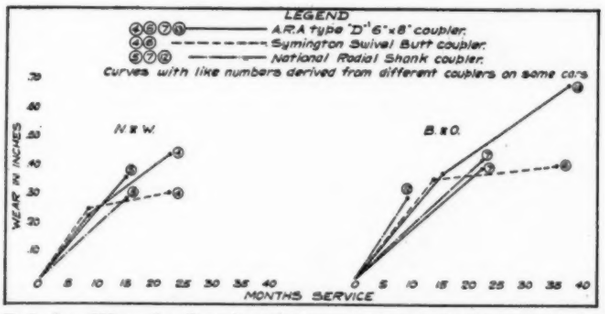
Recoil—The recoil shall be measured while making the capacity test. A minimum recoil, consistent with freedom from sticking, is desirable. The gears will be considered as having satisfactory recoil if the average for the five gears on the last blow before each one goes solid does not exceed 20 per cent with a 27,000-lb.tup. (Tentative, to be determined by test.)

Endurance Test—(a) The five gears which have passed the capacity test shall be subjected to the endurance tests.

(b) This test will be made according to a cycle whereby the gears will receive a maximum number of blows from a low fall of the tup. The cycle will be as follows: One blow at 1-in. free fall; one blow at 1-in. and one at 1¼-in. free fall; one blow at 1-in., one at 1¼-in. and one at 1½-in. free fall, etc.

Proceed thus up to a free fall which closes the gear to within 0.10 in. of solid, as determined by the use of a lead record. When this point is reached the gear shall be calibrated as during the capacity test, paragraph 9(a), and the cycle shall be started over again.

(c) The test shall end when not less than 25 million ft. lb. of energy has been delivered to each gear, provided failure does not


LEGEND
A.R.A type "D" 6"x8" coupler.
Symington Swivel Butt coupler.
National Radial Shank coupler.
Curves with like numbers derived from different couplers on same cars
N & W
B. & O.
WEAR IN INCHES
MONTHS SERVICE

Relative Wear in Couplers between the Draft Gear and the Front Follower as Established on Norfolk & Western and Baltimore & Ohio Gondolas and Hopper Cars

occur before this point. In no case, however, will the test be ended before the last cycle of blows has been carried to the point where the gear closes to within 0.10 in. of solid.

(d) At the end of this test the gears will be taken apart for inspection. In order to pass the test none of the gears may develop any of the following defects:

(1) Shortening, bending, crushing, or deforming an amount which makes the solid height of gear and followers ¼ in. less than the original solid height.

(2) Breakage of an essential part. Flaking or spalling of friction surfaces will not be considered as constituting such breakage unless it be of sufficient extent to interfere with the normal operation of the gear.

(3) Widening or spreading of any part or parts to cause binding in the standard pocket, 9⅛ in. or 12⅞ in.

(4) A reduction of capacity below 15,000 ft. lb.

Sturdiness Test—(a) The five gears which have undergone the endurance test shall be reassembled and subjected to the sturdiness test.

(b) Each gear shall be conditioned as follows: Make a 1-in. increment closure test, the same as the preliminary test, paragraph 8. Follow this by 10 blows ½ in. below the closing height and then make another 1-in. increment closure test. Give the gear 10 blows at the closing height just determined. Follow this by a 1-in. increment closure test and give another series of 10 blows at ½-in. above closing height just determined. Repeat in series of 10 blows each, calibrating after each 10 blows and increasing over-solid drop by ½-in. increment for each cycle until a total of 50 over-solid blows have been delivered. This will result in delivery of last cycle of 10 blows at a height of 2 in. over-solid.

(c) At the end of the test the gears will be calibrated as during the capacity test, paragraph 9(a). They shall then be taken apart for inspection.

(d) In order to pass the test none of the gears may develop any of the defects enumerated in paragraph 12(d), except that the capacity must not be less than 13,500 ft. lb.

Sticking—Sticking is a very serious fault in a draft gear. There is no definite test for sticking, and the action of the gears throughout all of the other tests will determine whether they are acceptable from this standpoint. Any type of gear which regularly and persistently sticks will not be acceptable.

Uniformity of Action—In order to be acceptable on this basis the five gears of a type must meet the following requirements:

1. In the capacity test, the capacity of no individual gear shall be more than 20 per cent above or below the average for the type.
2. During the endurance test, the maximum capacity developed by any gear shall not be more than 10 per cent above or below the average of the maximum capacities developed by each of the five gears.
3. No gear shall show more than 50 per cent increase in capacity after being placed in the endurance test.
4. In regard to uniformity of action in the gear itself, the closure on any blow should increase if the height of drop is increased. Serious deficiencies in this respect will be cause for rejection.

Exhibit B—Instructions Regarding Certificate of Approval for Draft Gears

The following instructions will govern in the matter of approval of different types of draft gears by the A. R. A. Committee on Couplers and Draft Gears.

Manufacturer is to make application for certificate to the secretary of the Mechanical division, A. R. A.

Separate application shall be made for each different type of draft gear for which approval is desired.

Each application shall be accompanied by four sets of blueprints showing the assembled gear and each separate part of the gear. These prints shall show the important dimensions of the assembled gear and of each part, and the dimensional tolerance permitted. The material of which each part is made shall also be shown, together with any limits or specifications for hardness, surface condition, finish, weight, etc.

Each application shall be accompanied by a draft in the amount of $2,000 to apply to the cost of making the tests herein prescribed.

The gears to be tested shall be procured by a representative of the committee, special care being taken to see that they are average commercial gears of the type shown by the drawings and specifications, and not gears specially selected for test purposes. The gears selected shall be shipped in sealed containers to the A. R. A. draft gear testing laboratory at Purdue University in such manner as not to be subjected to exposure, damage, and loss or interchange of parts. Record of identifying marks will be separately forwarded.

The manufacturer may have observers present when the tests are made, but such observers will be permitted to have no part in the tests. Neither will representatives of any other draft-gear manufacturer be allowed to be present during the tests unless by permission of the manufacturer of the gears under test.

The manufacturer's representative may discontinue the test and withdraw his gear at any time if he so desires. If this is done, there shall be returned to the manufacturer the unused part of the funds supplied to cover cost of testing. In order to resume tests a new application must be filed with the secretary of the Mechanical Division.

The Sub-Committee on Draft Gear Tests will exercise such supervision over the tests as it may consider necessary or desirable in order to insure proper adherence to the approved test procedure.

Official results of the test will be furnished to the committee, which will then issue or refuse a certificate of approval for that particular type of gear. Official copy of the test results will then be supplied to the manufacturer by the committee.

The certificate of approval issued by the committee shall designate the specification under which it is issued (e. g. A. R. A. 1930 or any subsequent reissue) and shall identify clearly the particular type of gear to which it applies. This certificate shall remain in force as long as no changes are made in the gear or in the specification.

If changes are made in a gear, the manufacturer shall at once notify the secretary of the Mechanical division. The committee will then decide if the changes are of such nature as to require a new test and new certificate. If they are not, the manufacturer shall return his certificate of approval to have proper notation concerning the change made thereon.

If changes are made in the specifications the committee will take the necessary action to determine whether approved draft gears conform to the changed specifications.

On or before January 5 of every year each manufacturer of draft gears shall notify the secretary of the Mechanical division as to what draft gears he is marketing under a certificate of approval. On February 1 of each year the committee shall issue for the benefit of the members of the A. R. A. a list of gears having certificate of approval, this list to show date of each certificate.

A manufacturer shall furnish to each purchaser of draft gears of a type covered by a certificate of approval, a guarantee that the gears furnished are the same as those covered by the certificate. If the purchaser so elects he may choose to make the tests given in the purchase specifications to satisfy himself that the gears are up to standard.

At its own expense, the Coupler and Draft Gear Committee may make complete specification tests of any type of draft gear at any time, in order to establish whether or not the standard is being maintained. Failure to pass this test may cause revocation of the certificate of approval, at the discretion of the committee.

Exhibit D—Purchase Specifications for Approved Draft Gears for Freight Service

Scope—These specifications cover inspections and tests which purchasers of approved types of draft gears may make in order to satisfy themselves that the gears furnished are representative of the type approved.

I. Manufacture

Material—All parts shall be made of material having the same physical and chemical properties specified in the certificate of approval granted by the Association. The manufacturer shall guarantee to the purchaser that this provision is complied with.

Dimensions—(Same as in Exhibit A).

Marking—(Same as in Exhibit A).

II. Tests

Number of Tests—The purchaser and the manufacturer will agree upon the number of gears to be tested. The inspector representing the purchaser shall select the gears to be tested. He shall have free entry at all times while work on the contract of the purchaser is being performed, to all parts of the manufacturer's works which concern the manufacture of the gears ordered.

Machine—The tests herein specified may be made in a drop-test machine having either a 9,000-lb. or a 27,000-lb. tup. The purchaser and the manufacturer will agree upon a suitable machine for making the tests. This machine should provide as closely as possible all the essential features of the A. R. A. drop-test machine located at Purdue University. The test set-up and definitions contained in the specifications for approved gears shall apply in these tests, except that the rate of working gears may be increased if this is satisfactory to both the manufacturer and the purchaser.

Preliminary Test—Each of the gears selected for test shall be given approximately 200,000 ft. lb. of work as follows: Make a closure test using the increments specified hereafter and

if the gear does not receive 200,000 ft. lb. of work in this test continue to give it blows at the specified height so as to bring the total work applied as close as possible to 200,000 ft. lb. If a 27,000-lb. tup is used start with 1-in. free fall and continue with 1-in. increments until the closure is within ½ in. of nominal total closure, use ½-in. increments until the closure is within ¼ in. of nominal total closure and then use ¼-in. increments until the gear is solid, or until it receives 200,000 ft. lb. of work. If a 9,000-lb. tup is used start with 3 in. free fall, continue with 3-in. increments until the closure is within ½ in. of nominal total closure, use 1-in. increments until the closure is within ¼ in. of nominal total closure, and then use ½-in. increments until the gear is solid, or until it receives 200,000 ft. lb. of work. If additional blows are required to bring the work up to 200,000 ft. lb. make them at a free fall ½ in. under the closing height if a 27,000-lb. tup is used or 1-in. under the closing height if a 9,000-lb. tup is used.

Capacity Test—(a) The capacity of each of the test gears will be determined by making a closure test as follows: If a 27,000-lb. tup is used start with zero free fall and continue with ½-in. increments until the closure is within ¼ in. of nominal total closure and then use ¼-in. increments until the gear is solid. If a 9,000-lb. tup is used start with zero free fall and continue with 1-in. increments until the closure is within ¼ in. of nominal total closure and then use ½-in. increments until the gear is solid.

(b) In order to pass this test satisfactorily a gear must have a minimum capacity of 18,000 ft. lb. The capacity at half travel should not be less than 25 per cent, and shall not be less than 20 per cent, of the capacity at full travel.

(c) In case not more than 20 per cent of the gears tested show capacity not over 10 per cent under 18,000 ft. lb. there may be substituted in the place of these gears alternates which shall be given the preliminary and capacity test. If the number of gears tested is not an even multiple of five and the number having capacity less than 10 per cent below 18,000 ft. lb. exceeds 20 per cent of the number tested by less than one, then sufficient additional gears shall be tested to bring the total number up to an even multiple of five. The provision for alternates will then be applied to this number of gears.

(d) The gears shall be considered as having satisfactory capacity if:

1. All gears meet the requirements.

2. At least 80 per cent of the gears tested meet the requirements, none of the other 20 per cent fall more than 10 per cent below the requirements, and all the alternates meet the requirements.

If these conditions are not met, the gears will not be acceptable.

Sturdiness Test—(a) The gears which pass the capacity test will be subjected to the sturdiness test.

(b) Give a cycle of 10 blows at the closing height determined in the capacity test. Follow this by a closure test using the same increments as during the preliminary test, par. 7. Give a second cycle of 10 blows ½ in. above the closing height just determined if using a 27,000-lb. tup or 1½ in. if using a 9,000-lb. tup. Repeat the cycles of 10 blows each, calibrating after each cycle and increasing the oversolid drop ½ in. for a 27,000-lb. tup or 1½ in. for a 9,000-lb. tup until a total of 50 oversolid blows have been struck. This will result in a free fall for the last cycle of 2 in. oversolid with a 27,000-lb. tup or 6 inches oversolid with a 9,000-lb. tup.

(c) At the end of this test the gears will be calibrated as during the capacity test, par. 8 (a). They shall then be taken apart for inspection.

(d) In order to pass the test none of the gears may develop any of the following defects:

(1) Shortening, bending, crushing, or deforming an amount which makes the solid height of gear and followers ¼ in. less than the original solid height.

(2) Breakage of an essential part. Flaking or spalling of friction surfaces will not be considered as constituting such breakage unless it be of sufficient extent to interfere with the normal operation of the gear.

(3) Widening or spreading of any part or parts to cause binding in the standard pocket, 9⅛ in. or 12⅞ in.

(4) A reduction of capacity below 15,000 ft. lb.

Results of Comparative Tests on A. R. A. Standard D and Type E Couplers Conducted at Sharon, Pa., January 20 to April 17, 1930

During the fourteen years the present D coupler has been standard, certain weaknesses and operating difficulties have naturally shown up. Some of these were remedied by slight changes in the shape of the parts which in no way affected interchangeability but others were of a more extensive nature and their correction would have made certain of the coupler parts no longer interchangeable with existing parts.

A careful study of all complaints of breakage or operating difficulties has been made which has shown the following:

(1) Hard operation.
(2) Failure of the top-operated lock-to-the-lock.
(3) Breakage of coupler head where knuckle tail strikes side wall.
(4) Breakage of lower end of lock leg.
(5) Breakage of front face of coupler.
(6) Occasional failure of lock-to-the-lock in bottom-operated couplers.
(7) Bent top lock lifters.
(8) Possibility of top lock lifter becoming locked beneath anticreep lug.
(9) Partings due to vertical slip-over of knuckles.
(10) Shank failures.

These features have been remedied so far as was possible without affecting interchangeability but as the complete solution of the troubles meant the design of new, non-interchangeable parts, it was thought best to make all the final necessary improvements at one time for the reason that this plan would greatly simplify the repair part problem.

Taking up the items in the order listed above, the improvements embodied in the proposed type E coupler are as follows:

Hard Operation.—In the standard D coupler the effective length of the knuckle-thrower arm from the center of the thrower pivot to the point of contact between lock leg and thrower averages 2.50 in. during knuckle-throwing movements. In the Type E coupler this has been increased to 4 in. This has been accomplished by a change in shape of the knuckle thrower and a corresponding change in the lock leg whereby the contact between lock leg and knuckle thrower is maintained close to the end of the knuckle-thrower arm.

Another operating improvement has been brought about by the attachment of the top lock lifter to the lock at a lower point on the lock and slightly further from the lock fulcrum. In the standard D coupler, the effective knuckle-throwing leverage exerted by the lock lifter upon the lock decreases rather rapidly as the knuckle opens while in the Type E coupler, the leverage is maintained at a considerably more uniform value because of the lowered point of connection between lifter and lock. The leverage figures for the two designs are given below:

	Start of knuckle throw	End of knuckle throw
Standard D	4.64 in.	4.34 in.
Type E	4.66 in.	4.50 in.

The increase in effective knuckle thrower beverage applies to rotary operated couplers as well as top operated.

Failure of Top-Operated Lock-to-the-Lock—This trouble in the standard D coupler has occurred particularly in top-operated couplers used in express service. It is caused by a jumping of the lock rather than by a slow, creeping action. An entirely different type of lock lifter and lock-to-the-lock has been incorporated in the Type E coupler. It is a two-part lifter, the parts being pivoted together for a limited movement relative to each other. The lower member which is hooked into the lock lies normally beneath a horizontal anti-creep ledge in the coupler head and is positively locked beneath the ledge when the top member is in its normal lowermost position. In lifting the lock, the first movement unlocks the lower member from the anti-creep ledge and then moves it out from beneath the ledge. This unlocking action is positive even when the coupler is buffed back 3¼ in. or pulled out 3 in. from normal.

After the lock drops to locking position, a rearwardly extending flange on the upper lifter member rests on top of the coupler head and forces the lower member back beneath the anti-creep ledge.

Breakage of Coupler Head where Knuckle Tail Strikes Side Wall.—In the Type E coupler, the top and bottom walls of the head where they join the side wall above and below the knuckle tail have been brought closer together and have been joined to the side wall by large fillets. These walls, therefore surround the knuckle tail more closely than in the standard D coupler, with the result that the buffing blows from the knuckle tail are distributed over a large area, and the bending stresses set up in the side wall are greatly decreased. In addition to this, the side-wall thickness has been increased ⅛ in.

Breakage of Lock Leg—In the standard D coupler the lock is carried entirely on the knuckle thrower when the coupler is locked. This support is considerably to the rear of the center of gravity of the lock, and causes the lock leg to bear against the rear wall of the lock-leg opening in the bottom of the coupler head. It also causes the upper part of the lock to tip forward against the inner front wall of the coupler head. Buffing blows cause the lock leg to kick forward and strike against the front wall of the lock-leg opening and then to rebound back against the rear wall, thus setting up a hammering action against both sides of the leg and ultimately causing breakage through fatigue. Vibration and baffing blows also cause the front upper corner of the lock to wear a shoulder in the front wall of the head, with the result that it interferes with free movement in raising the lock to lock-set position.

The new lock has a ledge extending over the knuckle tail, and the knuckle tail also has a shelf extending beneath the body

of the lock. These supports for the lock lie close to the center of gravity of the lock. Part of the weight of the lock is also carried on the knuckle thrower, with the result that the two supports extending toward the front of the lock and the third support on the knuckle thrower at the rear of the lock hold it in a very stable, upright position. Thus any hammering contact between the lock leg and the front or rear walls of the lock leg opening is prevented.

This triple support for the lock also keeps the upper part of the lock normally out of contact with the inner front wall and thus prevents wear at this point.

In addition to preventing lock-leg breakage by this method of lock support, the lock leg has been made considerably wider and stronger by an increase of .55 sq. in., or 28 per cent in its cross-sectional area.

Breakage of Front Face of Coupler—Four changes have been made. First, the guard arm has been redesigned to provide a more flexible or resilient connection with the front face of the coupler; however, further study is being made of this feature. Second, the front face thickness has been increased and a more uniform distribution of metal has been secured. Third, the notch provided in the standard D coupler through the upper face for the insertion of the lock has been eliminated. Fourth, the new proposed shank locates the key slot ⅛ in. higher than the present one, thus preventing some of the drooping of the coupler head which influenced breakage of the upper face.

Lock-to-the-Lock Failure in Bottom Operated Couplers—The new method of supporting the lock keeps the lock leg in a forward position and maintains a much greater overlap between the bottom lift toggle and the anti-creep ledge.

Bent Top Lock Lifters—The new two-part top lock lifter with the flexible connection between the parts should eliminate the bending and breakage which was occasionally found in the rigid one-piece lifter of the standard D coupler.

Possibility of Top Lock Lifter Becoming Locked Beneath Anti-Creep Lug—This was an occasional cause of trouble in the standard D coupler with the No. 1 lifter. In the new coupler, the anti-creep lug is above the lock instead of to the rear. The lifter is now pivoted to the lock by a partly closed hook and has no sliding action in the slot of the lock.

In addition to these changes, the rotary-operated form of coupler has been simplified by making the rotor shaft and lever in one piece instead of two.

Partings Due to Vertical Slipover of Knuckles—The depth of pulling face of knuckle has been increased from 9 in. to 11 in. to overcome the vertical slip-over of knuckles where maximum variation in heights of cars is present, combined with vertical irregularities in track. This increased safety is obtained by an increase of but four pounds in weight. The 11-in. knuckle is now a general standard on locomotives.

Shank Failures—These include the following: (a) Shortening of the shank, allowing the coupler horn to come into hard contact with striking casting; (b) Lateral bending, either toward the guard arm side or knuckle side; (c) Drooping of the coupler head, influencing breakage of the upper front face of the coupler; (d) Breakage of shank back of the head and through the key-slot.

These failures are taken care of in the redesigned shank, which has been made 6¼ in. deep, an increase of ¼ in. over the present standard. The width at the butt has been kept 5¼ in. as at present, but the shank has been tapered from the butt forward toward the head instead of being made with parallel side walls for a portion of its length, as is the present standard. This tapered construction produces an increase in shank width of 5/16 in. around the key slot. The cross-sectional areas of the new shank at various points are from 11.4 per cent to 26.5 per cent greater than the corresponding areas in the present standard. The shank weight has been increased 21 lb.

Interchangeability—The new knuckle and knuckle pin may be used in standard D heads, and when so used provide a support for the D lock similar to that in the Type E coupler. Also, D knuckles can be used in E heads and the E lock will be supported by the D knuckle.

E lock and knuckle throwers cannot be used in D couplers, nor can D locks and throwers be assembled in E heads. The rotary-operating parts of D and E couplers are not interchangeable and it is impossible to assemble either type of parts in the other type of head.

Thus the assembly of any non-interchangeable part in the wrong type of head is positively prevented, as the assembly of the coupler cannot be completed under such conditions. Knuckles are completely interchangeable, and either knuckle in the other type of head provides some of the advantages of the complete E coupler.

A joint meeting of the A. R. A. Committee on Couplers and Draft Gears and the Mechanical Committee of the coupler manufacturers was held in Cleveland on January 23, 1930, at which time the coupler improvements were given further careful study and approval, and arrangements made for service tests by representative railroads of the A. R. A. Committee.

Comparative laboratory tests were conducted by the Mechanical Committee of the coupler manufacturers under the supervision of the A. R. A. Committee on Couplers and Draft Gears at Sharon, Pa., January 20 to April 17, 1930.

Conclusions

A review of the test data shows the following:

(a) That the proposed Type E coupler shows a decided improvement in ease of coupler operation, and this improvement is more pronounced in the bottom operated coupler.

(b) That the redesigned mechanism of the coupler is a material improvement over the Type D both in strength and functioning of the parts, and it is believed that the better balance and arrangement of the parts will largely eliminate difficult operating conditions incident to service wear.

(c) That the general redesign of coupler head improves the face breakage. Additional tests are being conducted with modification in guard-arm design to determine what further improvement can be made in the guard arm in relation to the coupler face.

(d) That the increase in weight and better distribution of the metal in the shank will materially overcome the present failures due to shanks bending, upsetting and fracturing, and that the increased weight is justified.

Report on Swivel or Radial Butt Couplers

In the report to the 1929 convention, your committee called attention to the interest being manifested in Type D couplers with swivel butt and radial shank feature. Recognition was made of the desirability of some provision for an owning road to recover non-standard parts of swivel butt and radial-shank couplers removed on a foreign line. To take care of this situation Rule 17, Section C, of the Code of Rules was revised and the paragraph in the Rules referring to this subject reads as follows:

> "Couplers having A. R. A. Type D head, designed with swivel (or radial) butt, when removed account defective, shall be held and promptly reported to car owner for disposition. If car owner elects to have such parts (with the exception of knuckle, knuckle thrower, knuckle pin, lock and lock lifter) returned, shipping directions must be furnished within thirty days, freight charges collect; otherwise, such parts may be treated as scrap."

With this provision it is felt that the roads owning this special coupler equipment will not suffer any appreciable hardship on account of loss of parts until your committee is in better position to recommend upon this subject from an economic as well as a service standpoint.

(The sub-committee here described the results to date of a close study of couplers with radial shanks and with swivel-butts in comparison with A. R. A. standard rigid shanks. This study included an examination of the service record of Symington swivel-butt couplers applied to Pittsburgh & Lake Erie 70-ton hopper cars as early as 1924 and somewhat later on the Baltimore & Ohio. The service of this type of coupler as well as that of National radial couplers on the Pennsylvania and also on the Norfolk & Western has also been made a subject of study by the individual sub-committee members. The committee included in its report illustrations of the two couplers mentioned above; also of the American radial butt coupler and cast steel yoke, the performance of which will be studied during the coming year. The committee closed its report with the following two paragraphs.—Editor)

Developments so far indicate to your committee that there is some merit attached to the use of the radial feature in couplers. There is not, however, sufficient data available to permit an economic analysis of the subject, such as should be made before a recommendation from this committee is forthcoming. The committee is diligently pursuing this subject, taking advantage of all available information in connection with this study and it will require a longer observation period before any final deductions or recommendations can be consistently made.

The committee wishes to express its appreciation of the co-operation of the manufacturers of the swivel and radial butt equipment and the information they have supplied covering the results of their laboratory investigations. The committee also desires to recognize the cooperation that has been rendered by the New York Central in providing an opportunity for it to inspect the 70-ton cars that have been in service approximately six years with Symington swivel butt and A. R. A. standard couplers, and the information relating to the service test that was made available to the committee.

The sub-committee report was signed by H. W. Coddington, H. I. Garcelon and Donald Loose.

Discussion

K. F. Nystrom (C. M. St. P. & P.): I would like to mention first a change in the specifications for followers. That is obviously made to improve the action of certain draft gears. That may have some harmful result. I do not know if a follower would invert and upset the coupling.

In connection with the couper butt I would like to take up the investigation with the swivel butt couplers. The swivel has revealed an apparent weakness in our Type D coupler as far as the shank is concerned. The subcommittee's report indicates that the maximum wear of the key and slot is not full. If we examine some of the devices on exhibit in connection with swivel butt couplers and devices you would get the impression that we pushed the cars instead of pulling the cars. All kinds of devices are made for centering, but bear in mind we still pull cars and we should maintain a standard coupler, make that safe and eliminate its present weakness which is very evident. We do not have sufficient bearing surface for the key.

The committee has not recommended an increased bearing surface for the key. It is readily done. If, for certain reasons, it is not practicable at this time to increase our present style of key, introduce a vertical key and make it twice in thickness. The thickness of the present key can be materially increased, and so far as I can see without any danger of complication.

In connection with testing draft gears in the Purdue University, I refer particularly to the specifications,—I am disappointed that the endurance test has been limited to 25,000,000 ft. lb. I asked concerning the endurance of a gear being exhibited. It meets A. R. A. specifications. Personally I consider 25,000,000 ft. lb. entirely insufficient. We all know that we can get gears considerably above 100,000,000 ft. lb. Why limit the test to 25,000,000 ft. lb?

Any gear on the market today will stand up under 25,000,000 ft. lb. but for anything below 100,000,000 ft. lb. you do not receive value for your money.

W. E. Gray (Purdue University): I would like to answer Mr. Nystrom's comment regarding the 25,000,000 ft. lb. limit. All the gears on the market today will not withstand 25,000,000 ft. lb. As you stated, there was a time element involved which had something to do with choosing this 25,000,000 ft. lb. specification.

When we conduct endurance tests in ultimate construction and get values in excess of 100,000,000 ft. lb., the question comes up, what does that mean. I have been asked repeatedly, how much service does 100,000,000 ft. lb. represent? Does it represent five years, 10 years, 20 years, or what? I can't tell you, and I don't know of anyone who can tell you. If we don't know what it means in service conditions, it is questionable whether or not it is worth while conducting tests for that length of time.

It so happens that the gears we tested at Purdue were divided into two classes with respects to endurance. The ones which we might term weak did not stand nearly 25,000,000 ft. lb., in fact, they were under 10,000,000 ft. lb. Other gears went above 100,000,000 ft. lb. Last year we had in the specifications an endurance requirement of 10,000,000 ft. lb., and we have since raised that to 25,000,000 ft. lb., with a depreciation capacity down to 15,000,000 ft. lb. Endurance tests of 100,000,000 ft. lb., obtained on the A. R. A. tests were secured in depreciation to 13,500,000 ft. lb. That depreciation from 15,000,000 ft. lb., down to 13,500,000 ft. lb. represents a large part of the time taken up by the endurance tests so that the extra 1,500,000 ft. lb. depreciation does not mean the time is in the ratio of an initial depreciation of 27,000,000 ft. lb., down to 15,000,000 ft. lb.

The showing made by the gears we tested indicates that if a gear will withstand 25,000,000 ft. lb., it will withstand considerably more. You will notice our specifications now call for gears which have withstood 25,000,000 ft. lb. subsequently to undergo the sturdiness test. If the gear is weak or just about worn out, after it has withstood 25,000,000 ft. lb. it will not withstand the sturdiness test, so you have to take that fact in consideration when you raise the objection that 25,000,000 ft. lb. is not enough to determine the worth of any gears.

The purpose of these specifications is not to rate gears. We feel that if a gear withstands the tests called for by these specifications it will be worthy to be put on cars and locomotives. If we continue the tests, we might have one gear going to 100,000,000 ft. lb. and one to 150,000,000 ft. lb. Without considering any further figures we think the gear going to 150,000,000 ft. lb. was 50 per cent better than the gear going to 100,000,000 ft. lb. I think you will all realize there is very great danger in getting into faulty conclusions by such questions as that.

Those are some of the points that have influenced us in setting up the figure at 25,000,000 ft. lb. rather than 100,000,000 ft. lb. or 50,000,000 ft. lb. or whatever you choose. The requirements may be raised in the future. They might be raised by raising the 15,000,000 ft. lb. depreciation, or raising the 25,000,000 ft. lb. input. In any case the future trend will no doubt tighten up on the requirements.

Mr. Nystrom: I do not object seriously to the 25,000,000 ft. lb. as a minimum, but I do object to discontinuing testing at 25,000,000 ft. lb. The test should be continued until the gear is worn out so we would know the comparative value of the gears. Now you cannot distinguish a good gear from a bad one with this test. The 25,000,000 ft. lb. should be the minimum, and then continue above that. We are vitally interested in draft gears and draft gear inspection, and we have a systematic inspection the same as air brakes and elsewhere. On the Milwaukee we inspected 81,364 cars, and we know what we are doing. We like to know what we buy, but with this specification we will not know what we buy.

Mr. Gray: If the intention of these specifications is to provide data for rating draft gears so you will know draft gear "A" is worth $50 a car set, and draft gear "B" is worth $60 a car set, which I take it is what you are getting at,—we have the data gathered on A. R. A. tests at Purdue. The types of gears covered by those tests are standard gears. Some of them have been changed in design somewhat, but it will be necessary in order to provide such information to again go through a series of tests similar to what were conducted before.

Mr. Nystrom: So far as I know, there are only two or three gears on the market which have not been materially changed. Everyone got busy and made improvements and we don't know exactly where we stand now, so I say next year we start with another official test and let it take two years, but then we know what we have got.

C. A. White (A. C. L.): The first thing the draft-gear manufacturer pulls on you in selling gears is to pull out a chart from Purdue and shows you what goes on. If it doesn't mean anything it should be eliminated. I have been under the impression that particular feature did actually represent something in the form of service.

R. L. Kleine (Penna.): The tentative specifications on draft gears has been before us for a year. We have had all the specifications submitted to the draft gear manufacturers. With the exception of one draft-gear manufacturer, they gave us a unanimous approval of these specifications as the best that could be done at this time.

You will note in the Committee's report that these are specifications for acceptable draft gears for the present. That development work will naturally have to go on in the future. We are going to build a better draft gear, but we still must have a measuring stick as to what an acceptable draft gear is.

Mr. Nystrom: There is only one objection I have and that is the limit of endurance tests to 25,000,000 ft. lb.

Mr. Gray: Gears are not by any means worn out at the end of that 25,000,000 ft. lb. We have set that as a minimum which all gears must meet.

The time element is involved so that the committee may undertake a new series of tests next year as soon as we get new gears out and so you will have something to purchase new gears on while we are making those tests. With the improvement made in draft gears since the last test I will venture to state the next test will take four years rather than two. What we want is to get something to work with.

J. J. Tatum (B. & O.): As I understand the committee's report, they have set up a yardstick which was up to this time, the best they could start off with. They have not, as I read the report, said we should stop at what they have suggested, but they have given you the best they were able to find.

(*A motion to refer this portion of the report to letter ballot was carried.*)

[*A motion to accept that portion of the report referring to couplers, referring such matters as necessary to letter ballot, was carried.*]

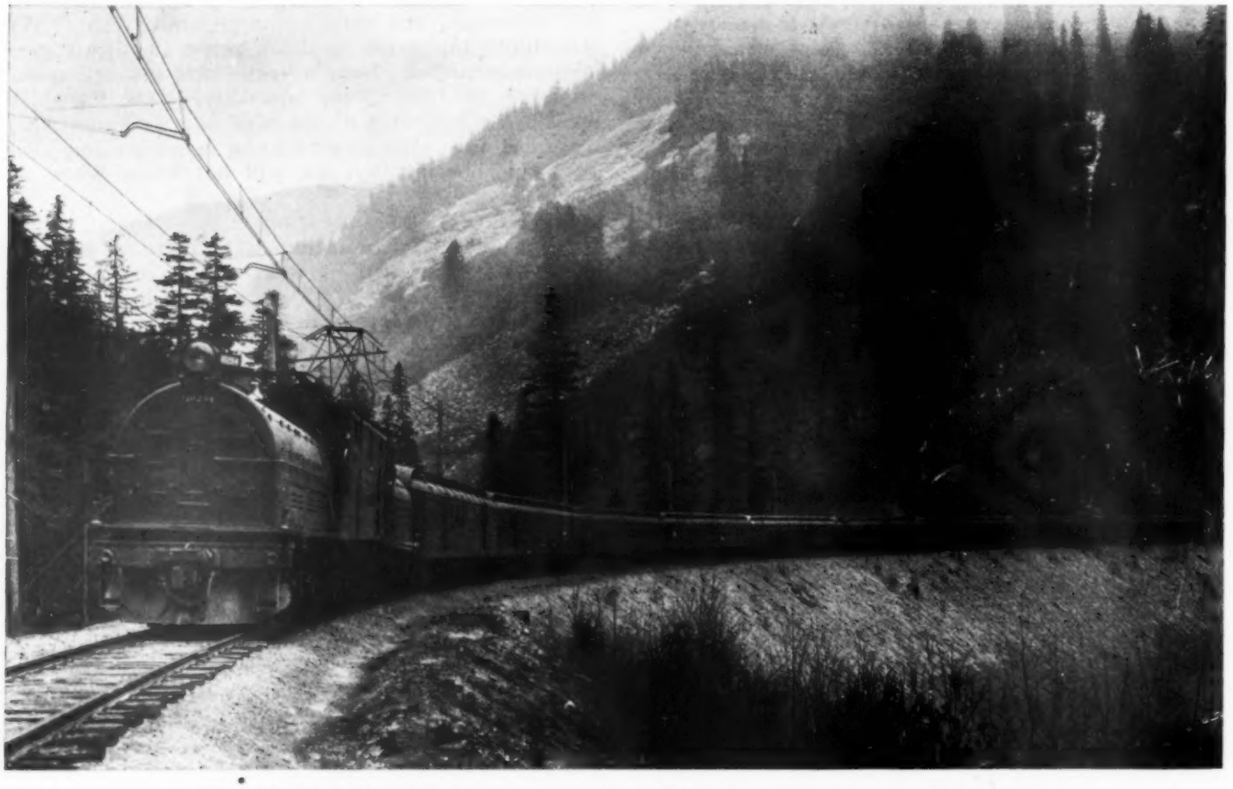
Swivel and Radial Butt Couplers.

H. W. Faus (N. Y. C.): The report gives a composite record of the wear in inches for all types of couplers in the comparative tests which are being followed by the sub-committee. It also gives comparative records for rigid-shank and swivel-butt couplers on the P. & L. E.

For the reasons outlined in the report, the amount of wear in the first service period of the P. & L. E. cars was estimated. Whether this estimate was correct or not is of no importance because it is not claimed, even by the manufacturers, that any less wear is shown by the swivel-butt type of coupler during the first six or eight months of service.

This estimate, however, resulted in a displacement of the entire P. & L. E. diagram and makes it appear at first glance that the results obtained by us on the P. & L. E. were not confirmed by the findings of the sub-committee on other railroads. As a matter of fact, they were confirmed to such a degree that a skeptical person might wonder whether they had been made to agree. Ignoring the figures representing wear during the first service period, which are unimportant and which cannot be compared because the P. & L. E. figures were estimated, the average rates of actual wear after the first service period were 0153 in. on rigid-shank couplers and .004 in. on swivel-butt couplers on the P. & L. E. The combined average of the N. & W., the B. & O., and the Pennsylvania were .0154 in. on rigid-shank couplers and .0041 in. on swivel-butt couplers.

The average swivel-butt wear in per cent of rigid-shank wear on the P. & L. E. was 26.1 per cent while that of the combined average of the B. & O., N. & W. and Pennsylvania was 26.6 per cent. The average reduction of wear effected by swivel-butt was 73.9 per cent on the P. & L. E. and 73.4 per cent on the combined average of the B. & O., N. & W. and Pennsyl-



The Chicago, Milwaukee, St. Paul & Pacific's "Olympian" in the Cascade Mountains

vania. All of the P. & L. E. cars involved in this comparison were 70-ton hoppers while on the other three roads the applications were distributed over 90-ton gondolas, 70-ton hoppers and 50-ton box cars.

Among other advantages of the swivel-butt coupler which we have found on the New York Central but which I will not discuss here because they are not referred to in the report are less punishment of the coupler head and less punishment of the draft gear. After more than six years' experience with it, there is no longer any question with us as to the mechanical and economic advantages of the swivel-butt coupler.

F. H. Hardin (N. Y. C.): *I move the adoption of the report as written,* and in so doing I want to make an explanation of our position in reference to this question.

An impression seems to have gotten out that the Pennsylvania and the New York Central, or, in other words, Mr. Kleine and myself, are at odds about this. Mr. Kleine and I are in absolute agreement insofar as the principle is concerned on the swivel butt coupler. We have at the present time 9,000 in service, and they certainly have justified their existence. We would like, naturally, to see it recognized in the Interchange Rules, because otherwise we are penalized in repairs on foreign lines. Mr. Kleine agrees with that also, but he would like to postpone that until, if possible, the manufacturers will get together among themselves and agree on a common standard. That is the only point of difference between Mr. Kleine and myself. I am not sure whether we can wait until they adopt a standard. I am not sure that they will ever get together on that standard, and we may have to adopt it for them, but every means that we may have should be brought to bear to get the manufacturers together on that question.

Mr. Kleine: Mr. Hardin has explained the position very clearly. There are two phases. One is, the Coupler Committee has been given the job to investigate the swivel and the radial butt coupler and the attachments that go with it. The committee is working on that, but naturally it is very slow. In the meantime there are a good many roads in the country which have put on swivel butts and radial butts, and I am heartily in favor of it until we adopt one standard, but we must get down to one standard on account of the many items which we have to carry in stock if we have two, three, four, or five standards.

So I will second Mr. Hardin's motion to include in the Interchange Rules the protection of the swivel and the radial butt couplers until such time as we get a standard.

[*The motion to accept this portion of the report was carried.*]

Committee on Safety Appliances

Abstract of report presented by H. A. Johnson, director of research in charge of the power brake Investigation

H. A. Johnson

The investigation of power brakes and appliances for operating power brake systems being conducted by the American Railway Association under Order No. 13528 of the Interstate Commerce Commission has been continued during the past year and the director of research is able to report substantial progress in the road tests which are now being conducted on trains operating under actual service conditions.

Progress of the Power Brake Investigation

The preliminary work of placing all equipment in first class condition, of making necessary repairs and renewals and of equipping the first 50 cars was completed and road tests were started on the standard type K equipment August 1, 1929.* All tests of this type equipment were completed January 3, 1930.

Each car was then given another rigid inspection, the draft gears and couplers were dropped, broken draft gear parts were replaced, and any other repairs and renewals were made to place the car in the same condition as it was at the start of the tests. The standard type K brake equipment was taken off and the pipes blown out. The Westinghouse FC-5 brake equipment was thoroughly cleaned and lubricated and was installed with all new gaskets. Leakage requirements were held to the same limits as in the original preparation work. Piston travel on all cars was adjusted to from 7½ to 8½ in.

The preliminary work of replacing all equipment in first class condition, of making necessary repairs and renewals, and of equipping the first 50 cars with Westinghouse type FC-5 equipment was completed and tests were started on this equipment January 20, 1930.

The tests on this equipment were still in progress when this report was written, but they should be completed before July 1, 1930. Following the tests with the Westinghouse FC-5 equipment, the schedule of tests will be repeated with the Westinghouse FC-3 equipment on the cars.

During all road tests, representatives of the Interstate Commerce Commission and the Westinghouse Air Brake Company have been present on the train. Many railroad officials have visited the tests, spending from a few days to several weeks in studying the methods used in the conduct of this work and in making observations of train operation under the various conditions. These visitors represent railroads in all parts of the United States and Canada.

When the road tests were started last summer the rack tests on the James triple valves had to be postponed as the K triple valves and part of the equipment were removed from the test rack at Purdue University for use in the road tests. After completing the road tests with the K equipment, the K triple valves belonging on the test rack were returned to Purdue University. The test rack has now been fixed up for the testing of the James valve. Mr. James has been notified to ship his valves to the power brake laboratory and install them for the tests.

The director of research presented a report before the executives representing all members of the American Railway Association in November, 1929, and another report at their meeting in Chicago, May 15, 1930. Moving pictures, relating to the development of the power brake investigation and showing the operation of the test train with an explanation of the organization and methods of tests, were made for and presented as part of the report before the latter meeting.

The director of research has continued to make semi-monthly reports to the director of the bureau of safety, Interstate Commerce Commission, copies of which are sent to R. H. Aishton, president of the American Railways Association; C. E. Chambers, chairman of the Committee of Safety Appliances, and V. R. Hawthorne, secretary of the Mechanical Division.

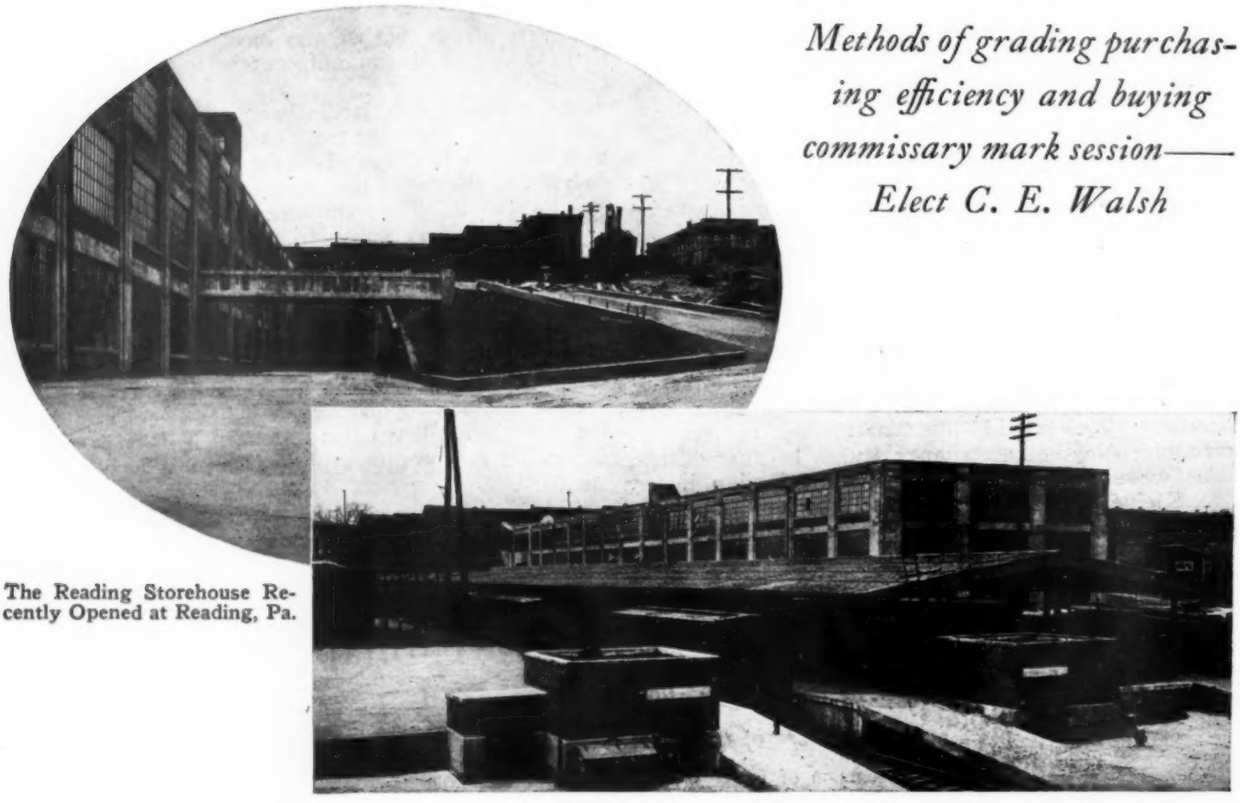
The report was presented by H. A. Johnson, director of research, American Railway Association.

[The moving pictures referred to by Mr. Johnson in the report were then thrown on the screen. *A motion to accept the report was carried.*]

*A comprehensive, illustrated description of these tests, as well as the methods and equipment used in making them, was published beginning on page 539 of the *Railway Age* of August 31, 1929.

Purchasing and Stores Division Closes Eleventh Meeting

Methods of grading purchasing efficiency and buying commissary mark session—— Elect C. E. Walsh



The Reading Storehouse Recently Opened at Reading, Pa.

THE eleventh annual meeting of the Purchases and Stores Division—A. R. A., was brought to a close at noon Friday after a three days' session in the new Auditorium at Atlantic City, N. J. The last day's session was opened at 10 a. m. with the presentation of and study on the desirability and methods of grading the efficiency of purchasing-department activities and was featured also by a comprehensive report on the purchasing of supplies for dining cars. Reports on terminal store keeping and supply budgeting were also received at the meeting. The meeting closed with a registration of approximately 400 delegates and guests and resulted in the election of C. E. Walsh, purchasing agent of the Pennsylvania.

The papers and reports, together with the discussion, follow.

Measuring Purchasing Department Efficiency

Essential factors to be considered outlined and method of grading given

By P. L. Grammer,
Assistant Purchasing Agent, Pennsylvania, Philadelphia, Pa.

P. L. Grammer

The cost of operating the purchasing department, without due consideration of all other related factors, is not a true index of its efficiency. It is possible to get operating costs per dollar of purchase down so low that the department may have facilities only for the most rudimentary forms of buying. Its records may be in poor shape, prices and buying methods out of date and relations with other departments and with manufacturers and selling agencies only mediocre. On the other hand, a purchasing department with a relatively high operating cost, may be saving its railroad many thousands of dollars in excess of purchasing operating costs, by improved and up-to-date methods, by being properly equipped to take advantage of market conditions and by expert knowledge of materials, markets and sources of supply.

The functions and activities of the purchasing department, which should be considered in arriving at proper conclusions as to its efficiency, may be grouped under the following general headings or classifications.

Public relations.
Inter-departmental relations.
Administrative and purchasing functions.
Detail departmental functions.

Public Relations

The number of friends possessed by a railroad has a direct bearing on its revenue and a properly conducted purchasing department can contribute to the building up of friendships for a railroad and help advertise it by contacts made with representatives of business organizations. These representatives are influenced by the promptness and cordiality of their reception, their comfort while waiting in reception rooms and the promptness

with which they get definite replies on questions relating to current business.

The following suggested practices should be considered in analyzing the efficiency of the purchasing department:

Callers should not be kept waiting unnecessarily. A comfortable reception room should be provided and a courteous interview given by an officer with authority to make decisions promptly.

Frequent calls should be made on manufacturing plants and selling organizations. As much knowledge as possible should be obtained about present or prospective sources of supply, and materials purchased. The contacts thus established will be found helpful in many ways.

Frequent calls should be made on other purchasing groups,—railroad, commercial, municipal, state and national, and visits from such groups encouraged.

Proper connections should be maintained with representative organizations having similar problems in the purchasing or administrative fields. Division VI,—A. R. A., is one outstanding group of this class. Time and experience devoted to the common good pays dividends.

Departmental Relations

Co-operation in interdepartmental relationships is one of the most important requrements for efficient operation. Suggested practices in this group are as follows:

Keep the management fully informed of the aims, problems, and accomplishments of the purchasing department.

Close relations with the stores department should be maintained on the most efficient basis so that no functions will be performed by both departments which might by co-operation or adjustment, be performed by one department for both, or by one group serving both departments. For example, does the stores department furnish requisitions which can be made into purchasing orders without rewriting in the purchasing department? Where purchasing and stores Departments are located at the same point, are central filing, central mailing, central typing and transcribing bureaus established to serve both departments?

Maintain close personal contact with all departments of the railroad, as in no other way can the purchasing department reach its highest point of service to the railroad.

Administrative and Purchasing Functions

These are the most vital functions of all to the purchasing department and the most difficult to measure from an efficiency standpoint. The difference between what has been and what should be presents a problem of real magnitude.

Suggested practices and methods of analysis in this group are as follows:

The comparative value of purchases made on the basis of only one source of supply. Why cannot these purchases be brought into the competitive field?

The amount of cash discounts taken.—Can the amount of such discounts not be increased by proper efforts?

Savings made due to—

(a) the substitution of less expensive grades of materials which meet all requirements.

(b) reducing prices which may be too high as compared with the cost of labor and material entering into a completed product.

Establishing competition for materials for which formerly only one source of supply was available.

Proportioning the value of materials carried in stock by sellers, by special arrangement, permitting immediate shipments as required, thus reducing stocks carried by the railroad.

Recording the prices of raw materials entering into certain products, also prices paid for such furnished products.

The spread between the costs of basic materials and finished products can best be shown by graphs or charts and should provide an interesting and profitable study.

A price index should be maintained for the more important items of material, as recommended in report of the A. R. A. committee on Purchasing Agents Office Records and Office Organization for 1929. This price index should be maintained from actual purchases, with the prevailing price on the date the index is inaugurated being listed as 100 per cent. Subsequent reductions or increases in prices listed from time to time will then form the basis for comparison on percentage basis with prices used in the inauguration of the record.

The amount of business placed with various firms. The distribution of business should be made in the best interest of the railroads as a whole.

Materials should be purchased on the basis of standard specifications wherever practicable and adequate arrangements should be made for inspection and tests prior to acceptance.

Blanket orders when issued to permit local consuming points to draw certain supplies direct from sellers, should be frequently reviewed to determine whether purchases so made are costing more than conditions justify.

Direct purchases of materials by operating forces for use in emergencies should be carefully checked and kept within proper bounds.

Attention should be paid in purchasing materials to insure that higher prices are not paid unnecessarily for piecemeal purchases than could be obtained in lots sufficiently large to command the best prices or discounts.

Price records should be reviewed at frequent intervals to insure that no prices are being used which are obsolete with current markets.

Contracts or period commitments should be made for all materials which can profitably be purchased on such a basis.

A frequent review of inquiry lists should be made to see that they are purged of inactive names and such names of new firms added that should be considered. This applies to both purchases and sales.

FORM FOR RATING PURCHASING DEPARTMENT EFFICIENCY

To be prepared at stated intervals. Efficiency Marks: Excellent 100: Very Good 90: Good 80: Fair 70: Poor 60.

	Data-Remarks	Rating
A. *Public Relations:*		
1. Callers should not be kept waiting unnecessarily, etc.		
2. Frequent calls should be made on manufacturing plants, etc.		
Etc., etc., etc.		
Average Group Rating.....		
B. *Interdepartmental relations:*		
1. Keep management fully informed of aims, problems, accomplishments, etc.		
2. Close relations with Stores Dept. should be maintained, etc., etc.		
Etc., etc., etc.		
Average Group Rating.....		
C. *Administrative & Purchasing Functions.*		
1. Comparative value of purchases made on basis of 1-source of supply, etc.		
2. Amount of cash discounts taken, etc.		
Etc., etc., etc.		
Average Group Rating.....		
D. *Detail Departmental Functions.*		
1. Number of requisitions received, etc.		
2. Average length of time between receipt of reqn. and issuance of order.		
Etc., etc., etc.		
Average Group Rating.....		
Recapitulation:		
A. Public Relations.....		
B. Interdepartmental Relations.....		
C. Administrative & Purchasing Functions.....		
D. Detail Department Functions....		

The amount of refunds made to purchasers of scrap materials due to short weights, improper classifications, etc., and what percentages such refunds to individual purchasers bear to the total sales made them.

Insure adequate supervision of office forces. Are they working under the best possible conditions as to light, air, temperature and are they properly equipped with up to date mechanical devices?

All forms and blanks used should be reviewed frequently to see that they conform to best practices and usages, that they are all necessary and that they are not unduly expensive as to paper or make up.

Insure proper and systematic training of forces for increasing usefulness and more responsible positions so that if any job is made vacant no matter how important either temporarily or permanently a suitable man will be available to fill it.

Detail Departmental Functions

The principal items for consideration in this group are the following:

1. The number of requisitions received as compared with number of orders issued. Does the proper balance exist between these two items to insure the most economical operation?

2. Average length of time between the receipt of requisition and the issuance of the order.

3. The number of orders issued on the basis of current prices

established by contracts or agreements or price records, and the per cent each bears to the total.

4. The number of orders, if any, issued without current competitive prices, and the percentage they bear to the total.

5. The number of orders on which new prices must be obtained before placing business, and their percentage of the total.

6. The number of emergency requisitions received, and their percentage of the total.

7. The number of cases where information is asked for by the seller before he can fill orders, and the percentage of these cases to the total orders issued.

8. The number of orders hurried, and the percentage of the total issued.

9. The percentage of total orders on which deliveries were not obtained within delivery dates specified when the order was placed, and the percentage of orders on which deliveries were made made prior to the dates specified.

10. The number of adjustment cases, and their percentage of the total orders issued.

11. The number of invoices received, discountable and net.

12. The average number of invoices received per order issued.

13. The amount of cash discount lost through delay in paying bills.

14. The number of invoices which cannot be checked at once, with the price records, or orders due to errors in price, etc., and their percentage of the total.

15. The average time required to pass invoices through the purchasing department.

16. The number of letters received requiring reply. The average time between the date of receipt and reply, and the average time required to distribute mail after its receipt in the office.

17. The number of files maintained. Because it may be possible to reduce the number of files.

18. The relative number of stenographers, number of operators transcribing dictating machine records.

19. Are centralized filing and mailing bureaus operated serving two or more departments?

20. The average length of time required to complete the operation of filing, after papers, invoices, orders, etc., are ready for filing.

21. The monthly cost of:—
Purchasing agent and assistants.
Chief clerks and general supervisors.
Requisition markers.
Price inquiries and tabulations.
Maintaining price records.
Issuance of purchasing agent's orders.
Price and bill checking.
Hurrying shipments of materials.
Correspondence and files.
Sales.
Statistical records.
Miscellaneous.

22. The total cost of operating the purchasing department.
a. Per dollar of purchase.
b. Per car mile.
c. Per dollar of gross earnings.

23. The total value of stocks of materials on hand as of stated dates and the days' supply this represents.

24. The value of reels and containers on hand, paid for by the railroad and to be returned to sellers for credit.

General

While certain statistical information as to costs, functional details and volume of business should be kept monthly, the general review for checking efficiency may be made quarterly or at such other intervals as may be desirable.

Over development in records and statistics produces an unwarranted increase in expenses and no records or statistics are justified unless it can definitely be shown that they produce economies sufficiently in excess of their cost of production. Statistics and records not used to advantage are worse than useless.

An outline draft of a form has been prepared which is designed to facilitate recording and evaluating the necessary data and efficiency ratings as the examination of purchasing department functions are made from time to time. As additional examinations and surveys are made, the records will be found increasingly valuable as they will then give a basis for comparison as to improvements which may have been made over a given period, which will be lacking in first survey or examination. The form suggested, is self-explanatory. The method of efficiency marking recommended is Excellent 100; Very Good 90; Good 80; Fair 70; Poor 60.

Discussion

C. K. Reasor (Erie): How are delivery dates specifie on your P. A. orders so as to insure delivery and destination at the time required?

Mr. Crammer: The orders specify the delivery date when the material is supposed to be shipped.

J. W. Gerber (Southern): What proportion of the orders show delivery dates?

Mr. Grammer: Our practice is to mark delivery dates on all of our orders.

The paper was accepted without further discussion.

Report on Controlling Railway Supplies

More advance planning urged to avoid surplus material——
Budgeting methods again favored

W. H. Morris
Chairman

In reviewing the advancement that has been made during the past ten years in the control of the investment in materials, the committee has considered the following progressive steps:

1. The organization of the Stores Department as a specialized force to order, store and handle the material and supplies used by railroads. Because of the millions of dollars invested, the importance of such an organization has been recognized as essential.

2. The stock book, together with the master stock book, covering the units of material used on the railroads, establishes a systematic method for the ordering of material which has become the basic principle in storekeeping.

3. The adoption of the material classification which segregated the thousands of items of material into classes, thus simplifying an analysis of the total stock and establishing uniformity for comparative purposes.

4. The classified balance sheet, giving values of material by classes, furnishes officers of the railroads a comprehensive statement of the operation, including the per cent of turnover and the days' stock on hand.

5. The standardization and simplification of items of material in co-operation with the Department of Commerce, U. S. Government, has reduced the number of sizes of many items, and is also rendering a service to the manufacturer.

6. Unit-piling of materials not only has made for an orderly storing of material, but has aided stock men in taking monthly and annual inventories.

The obtaining of complete advance information of actual needs of contemplated programs is necessary to efficient control of the investment. The responsibility of procurement is the duty and function of purchasing and stores officers, and the extent to which proper control can be attained is dependent in a large measure on knowledge of the actual requirements before the materials are ordered.

Realizing the necessity for efficient control of material stocks, the committee wishes to emphasize the importance of a most careful and intelligent use of the stock book, which is the foundation or basic principle of storekeeping.

Program Work

Many railroads have made substantial reductions in the value of stocks by receiving advance information from the Mechanical Department covering the program of heavy repairs to engines and cars, and the committee strongly recommends that all members encourage such reports, thus affording ample opportunity to deliver the material when actually needed for progressive or programmed work which will result in a good turnover. It should not be amiss to reiterate that close co-operation between

the ordering and using departments is necessary for the successful control of material balances.

Pricing Requisitions

During recent years a number of roads have priced the requisitions at the time of writing, thereby providing a better means of visualizing the value of stock ordered. This method gives an additional control of contemplated expenditures and permits a reduction of the quantities if necessary, or a cancellation of the entire order if existing conditions change. Although there appears to be some merit in this plan, it may not be advantageous on the smaller railroads, where the value of material ordered does not warrant this expense.

A. F. E. Estimates

The purchasing and stores officers should receive a copy of the estimates of expenditures prepared by engineers and others, when approved, covering new equipment or changes in the existing equipment. The estimates should be divided between labor and material to enable these officers to check the list, and to report to the originating department if the value of the materials exceeds the appropriation and likewise to avoid excess accumulations, as the material may become obsolete before being required for other work. If any excess is reported after a job is completed, it should be placed on a list known as the irresponsible or advertising list.

Budgets

The committee made a comprehensive report in 1927 and 1928, relative to the control of stock balances by fixing the amount to be expended in advance of issuing of the requisitions. Estimates are computed of the stock on hand, amount due, amount used, amount received from all sources, divided between maintenance of way and maintenance of equipment material, and the value of **operating need** thus determined.

When this data has been compiled, a comparison is made with the cost of units. If the latter cost exceeds the **operating need by purchase,** a revision is made.

The committee is of the opinion that the discussion of previous reports evidenced a misunderstanding. Those using the plan outlined are positive that better control of expenditures has been secured and reductions are evident.

Reduction of Units

Some of the smaller railroads have obtained successful results in purchases by taking the average past consumption and ordering in the same ratio as the existing conditions warrant. Thus, if a 10 per cent reduction is made in the man hours in either shops or roadway forces, a 10 per cent reduction in the consumption of material is assured and the orders are made accordingly. This reduction co-ordinated with the information received from the using departments covering the subsequent program and the outlook has aided in the control. It is likely that the purchase and store officers are in closer touch with the officers of the using department on the smaller railroads.

The report is signed by: W. H. Morris (chairman), general storekeeper, Reading; A. R. Dale, general storekeeper, Florida East Coast; R. C. Harris, general storekeeper, Pennsylvania; F. G. Hawes, chief of planning and stock control bureau, Chesapeake & Ohio; T. A. Hodges, general storekeeper, Seaboard Air Line; S. E. Keillor, district storekeeper, Canadian National; K. A. McDonnold, chief clerk to purchasing agent, Kansas City Southern; W. R. H. Mau, assistant to general purchasing agent, Gulf Coast Lines; F. G. Mole, storekeeper, Oregon Short Line; W. S. Morehead, assistant general storekeeper, Illinois Central; A. S. Thompson, purchasing agent and storekeeper, Columbus & Greenville; G. W. Bichlmeir (chairman ex-officio), general purchasing agent, Union Pacific.

Discussion

W. H. Morris (Reading): In working up this report, the committee, of course, sets up the ideal which we are all striving for, and we pointed out as you will note the several methods used on this important question of controlling material. We found in our deliberations that conditions existing on the large road which can afford to go into greater detail and find it necessary to secure this information, have a more elaborate plan than the smaller roads where the general storekeeper reports to the general manager. They may be in the same building and come in contact with each other, daily, the store's organization and the purchasing officers, and they know the changes that are made from week to week. As a consequence, they know the revenue that the road is deriving. The smaller road has been using the other method that has been laid out here and that is, namely, making a reduction in their monthly requirements on the basis of the reduction in man-hours in the shops, establishing a ratio which has been found wise over a period of study.

The figure of 10 per cent that has been made here is merely for comparison, or to illustrate the thought in mind. It may not necessarily mean that 10 per cent reduction in shop man-hours would necessarily mean a 10 per cent reduction in material stocks. It may be greater.

The committee also found that a number of roads have been working out the pricing of requisitions and some have secured sufficient advance information from their mechanical or maintenance forces to enable them to work this material program accordingly.

This is in line with that which other committees in this organization have suggested, and that is the all-essential point of a stores organization having a definite knowledge of the mechanical program and keeping in close touch, almost as a brother, with the using department.

Of course, that follows down all the way to the stocker, and the lowest in range in the store organization to keep posted, if not by the using department by the supply department.

The committee also found and desires to bring out the point that engineers, if there are any present, have a tendency to be extravagant. In making up their estimates, they will fix their need considerably greater than is found by the roads participating in this committee to be far in excess of the actual needs. As a consequence, the committee calls attention and would like to go on record as having the proper officers see that the engineering force which makes these estimates submit a list to the stores department so that a check can be made of the excess, and which has been found to become obsolete or not usable because it was purchased for a particular job that may not be rebuilt or a similar job built for a number of years.

The committee has also made a short report of the use of the larger road that makes the study based on the estimates of expenditures and working it down to need by purchase, which for the reason that it is used continually, it has been successful on those roads.

O. Nelson: Referring to the paragraph of the A. F. E. estimates, I might be able to give some information that might be helpful. On our railroad we ask the engineering department to furnish a requisition for the necessary material they are going to use on their approved orders. These requisitions are held up until the orders have been approved before they are finally let loose on them and turn them over to the stores department. In that way, we get a detail of requirements and have an opportuity to go over it with them.

In connection with the advance information on program work, I have been working on that subject for the past two years with our mechanical department particularly. We haven't had so much trouble with our other departments. I am glad we made some progress. However, it has not been entirely satisfactory. They seem to be willing to co-operate on the subject, but it seems to be difficult for the men in the department to realize the benefit that they would derive from that system of handling. I have noticed on some railroads that they are working with it successfully, and I felt that we should be able to do the same, but it has been slow.

L. F. Duvall (A. C. L.): When I first received this advance copy, I was beginning to think they were leaving out the most important thing, that is, what Mr. Nelson just mentioned. On page 3—Advance Information—Program Work—we find that is very important. If we have no advance information, of course, we have to fall back on the old reliable stock book. We all know the stock book is reliable in a large percentage of cases, but sometimes the stock book fails to get the necessary result we are looking for. When we have advance information from the using department, and a careful check is made of the information that is given us, we find it aids materially in keeping stocks down. We are working on such a program on the Atlantic Coast Line, and believe that eventually we are going to get some very good results. It requires a good deal of thought; it requires a good deal of study on both the using and stores departments to work out this program successfully.

For instance, we all have been repairing box cars. They receive some information in advance that they will discontinue repairing this particular car and go to the flats.

We all know that the flat cars have a lot of things on them that box cars do not have. A storekeeper at that particular point has advance information that beginning maybe two weeks hence, we will have a program of repairing certain classes of flats. He can get with the car foreman and study out some program as to what he thinks he will need and get that material on the ground without suffering shortages. It certainly helps, there is no mistake about that. I am glad the committee brought that out in their report, because it is a very important item.

Report on Methods of Pricing Materials

Bin pricing held superior to price books——Uniform basis of prices urged——Cost studied

J. C. Jackson
Chairman

Direct pricing, in some form, is recommended as compared to pricing in the office from the price book, where the pricing work can be absorbed by stockmen or section storekeepers without additional payroll expenditure or with a reduction in the office payroll. Direct pricing means the pricing of materials in the proximity of their location and by the parties actually issuing or in charge of material.

Prices to Use

One of the prime requisites to pricing is the procurement by the purchasing agent of net prices, delivered, and manufacturers should use same physical unit in invoicing as that shown on the railroads quotation sheet and purchase order. This obviates the complications that result in figuring discounts and computing advance freight charges, and simplifies the work to the extent that the price shown on the shipper's invoice is what the item actually costs net, so that this price can be transcribed to any pricing record without additional computation and without the efforts of a qualified price clerk.

Wherever purchasing agents find it practical to request that material be billed at net prices delivered to the line of road, it is recommended that it be done. The committee recognizes, however, that there are cases where a request for net prices would create some unnecessary detail, greater than that of figuring discount from lists, freight, etc.

Another essential to direct pricing is the classifying or grouping of materials on all requisition forms in compliance with the physical grouping of the materials in the storeroom.

Methods of Direct Pricing

There are several different methods of direct pricing and the committee is unable to recommend any one practice. The three methods of direct pricing discussed were:

1. From the stock book, using current or average prices.
2. From the material or tags attached, using actual prices.
3. From bin cards, using current or average price.

The committee made an effort to determine the cost of pricing per 1,000 items, errors occurring, etc., by the direct method of pricing as compared with cost of pricing by the centralized pricing system.

It is impossible to determine the actual cost of pricing, unless the volume of business is very limited. The pricing is interlocked with other work and handled by so many different individuals that the actual amount of time involved in pricing could only be estimated. On some roads it was considered that extra cost would be entailed, for direct pricing, while others found it to be less expensive. Local conditions enter into the question to a great extent and the committee is unable to give comparative costs under the two systems.

In the majority of cases, those who have adopted the recommended methods are satisfied that they have improved the service and not increased the cost.

The report is signed by J. C. Jackson (chairman), general storekeeper, Canadian National, Grand Trunk Western; J. S. Genther, general storekeeper, Lehigh & New England; J. P. Kavanagh, general storekeeper, Chesapeake & Ohio; J. P. Kimmel, district storekeeper, Chicago, St. Paul, Minneapolis & Omaha; J. K. McCann, general piece work inspector, Chicago, Burlington & Quincy; W. E. Rawson, assistant general storekeeper, Southern Pacific Lines (Tex.-La.); J. U. King (chairman ex-officio), general storekeeper, Atlantic Coast Line.

Discussion

Y. K. Hall (Union Pacific): I am not here to take any exception to any method of pricing that anybody may bring forth. That is their individual business. As far as we are concerned, we are going to do it the way we want to.

There is something that I do take exception to, however. It is all right to fool the other fellow, but as Frank Reed says, don't kid yourself. When we say, "Where the pricing work can be absorbed by stockmen or section storekeepers without additional payroll expenditure or with reduction in office payroll" we are just kidding ourselves. If you have three or four price clerks in an office, you are going to change your method of pricing.

On the Union Pacific, our material handlers are busy men. If we did that work out there, we would simply have to increase our force. I want to call attention to the fact that the committee agrees with me. In the first paragraph they say, "It can be done without any additional expenditure." At the end of the report they say, "In the majority of cases, those who have adopted the recommended methods have satisfied themselves that they have improved the service and not increased the cost." On the first page they say it does not cost anything, and on the last page they say it has not increased the cost. I think we should be consistent. If we want the price outside, that is all right, but it is going to cost money wherever we do the pricing.

I move that we strike out from the first paragraph the phrase, "where the pricing work can be absorbed by stockmen or section storekeepers without additional payroll expenditure or with reduction in office payroll."

C. D. Baldwin (Bangor & Aroostook): I do not see any objection to this thought. We are not trying to fool ourselves or fool anybody else. I certainly do believe

that some pricing can be done by the shop men or section storekeepers better than anywhere else. This paragraph says that it can be absorbed by stock men or section storekeepers without additional payroll expenditures. That is not a positive statement that it will reduce the payroll and perhaps nobody thinks it will to any great extent. I cannot see any objection to leaving that clause in the paragraph just as it is. I do not favor this motion.

J. W. Gerber (Southern): I also disagree with Mr. Hall in his statement that you cannot price your material in the store house without additional cost, because we are doing it. If you will come to one of our main store houses, we will show you how it is done. Our stock men are not overburdened. The question of putting the price on the requisition is merely a matter of checking. He has his price and that price goes out into the shop in a great many cases and the work is done at odd times. It has not increased our payroll one cent. Eventually, we will reduce our payroll for distribution clerks. We have not done it so far for various reasons, but we will eventually decrease it by the use of this method.

L. C. Thomson (C. N.): It all depends on the method you use in pricing in the store. If your stock keepers price from a price book, possibly you do not make any saving in the payroll. But if he is pricing from the material or from a bin tag, I believe that you will not increase your payroll, and you will get far more efficient prices.

J. J. Kukis (Erie): Regardless of whether the person is putting on the prices or any other information, it takes so much time to put it on, whether it is done in the office or out in the yard or in the building. The point that Mr. Hall brings out is that there is no possible chance of doing that work for nothing. I fully agree with him that there is not any payroll saving.

The Chairman: All in favor of Mr. Hall's motion, make it known by saying "aye;" objecting, "no." The noes have it.

Mr. Hall: I ask for a standing vote.

The Chairman: All in favor of Mr. Hall's motion, please rise. (55 rose.)

All in favor of the committee report, standing as presented, please rise. (69 rose.)

The report was adopted as presented.

Report on Dining Car and Commissary Supplies

Second year's study of committee produces further specifications to govern buying——Labor camps and laundries investigated

H. N. Mellor
Chairman

Following the suggestion of last year's committee in effecting economy by adopting linen napkins size 20 in. by 20 in. three railroads on their initial purchase of napkins conforming to the new sizes, made a saving from 15 to 19.7 per cent or $4,889. compared with prices asked for former sizes.

It is recommended that the size of linen napkins 18 in. by 22 in, recommended in the 1929 report for use on dining cars be eliminated and that one standard size 20 in. by 20 in. be used.

Napkins for use in railroad hotel, restaurant and lunch room service should not exceed 18 in. by 18 in.

In the report of last year's committee it was suggested that table cloths have a side drop of not more than 8 in. and end drop of 12 in. Two railroads on their initial purchases made a saving of 13.6 to 18 per cent or $1,000.

The adoption of standard references for canned goods and other materials is as essential as other railroad stores material. It permits proper classifications on stock sheets, cards and bin tags which simplify inventories and accounting methods.

Requisitions and orders will be properly prepared and sellers will understand thoroughly the pack and weight of goods desired, and will be in a position to quote intelligently, thereby eliminating unnecessary questions and correspondence.

When samples are submitted for examination, comparisons can readily be made to ascertain the proper quality, besides the best pack, and weight may be determined by draining the contents of tin for two minutes on a one-eighth mesh screen, except tomatoes, which should be drained over a sieve of one-fourth inch mesh.

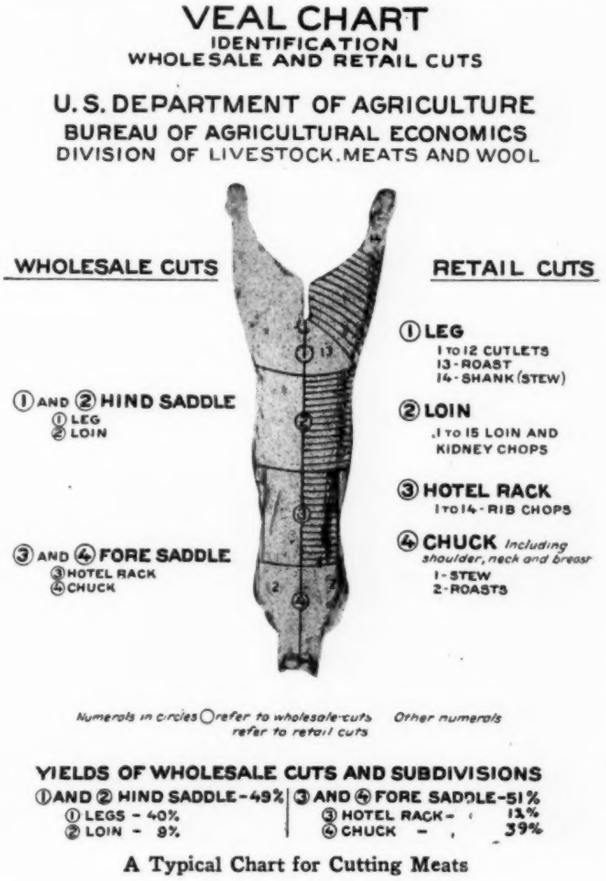
To simplify the purchasing and establishing of standard references, it is suggested that the descriptive references as used by the trade be adopted to insure intelligent bids from sellers.

(The descriptions are contained in the committees report.—Editor.)

Boarding and Wrecking Outfits

This committee made a study of 17 representative railroads and found seven operating boarding outfit service for their own account on self-sustaining basis and in an entirely satisfactory manner, believing that better living conditions are thereby provided, resulting in less labor turnover and a more satisfied group of employees.

Little information is available with respect to the general terms and conditions included in the agreements between the railroad and contractors as to the latters furnishing food sup-


VEAL CHART
IDENTIFICATION
WHOLESALE AND RETAIL CUTS
U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS
DIVISION OF LIVESTOCK, MEATS AND WOOL
WHOLESALE CUTS
RETAIL CUTS
① AND ② HIND SADDLE
① LEG
② LOIN
③ AND ④ FORE SADDLE
③ HOTEL RACK
④ CHUCK
① LEG
1 TO 12 CUTLETS
13 - ROAST
14 - SHANK (STEW)
② LOIN
1 TO 15 LOIN AND KIDNEY CHOPS
③ HOTEL RACK
1 TO 14 - RIB CHOPS
④ CHUCK Including shoulder, neck and breast
1 - STEW
2 - ROASTS
Numerals in circles refer to wholesale cuts Other numerals refer to retail cuts
YIELDS OF WHOLESALE CUTS AND SUBDIVISIONS
① AND ② HIND SADDLE - 49%
① LEGS - 40%
② LOIN - 9%
③ AND ④ FORE SADDLE - 51%
③ HOTEL RACK - 12%
④ CHUCK - 39%

A Typical Chart for Cutting Meats

QUESTIONNAIRE	Road A	Road B	Road C	Road D	Road E	Road F
Average number of pieces washed per month, i. e., Table Cloths, Table Tops, Napkins, Waiters Coats, Cooks Coats, Cooks Caps, Blankets, Aisle Strips and various other pieces handled	1,254,590	420,801	300,275	141,589	1,200,000	.....
Total cost of operation	10,500.00	(For items shown above) $2,776.65	$3,334.29 per mo.	$1,674.48	$7,234.00	$3,311.20
Average cost per hundred pieces laundered	84 cents	$ .6598	$1.07¾	$ 1.18	$ .6026	$1.12
Approximate average cost per 100 pieces if work had been handled by commercial laundry	$1.25	$ 1.34	$1.93	$ 1.50	$ 2.00	$1.60
Average economy per 100 pieces per month by railroad operating own laundry	41 cents	$ .6802	85 cents	$ .32	$1.3974	$ .48
Do you figure life of your linen has been prolonged through handling in your Laundry, as compared with having work done by Commercial Laundries	Yes, 25%	.....	Yes, 25 to 40%	Yes	Yes, 33⅓%	Yes

Ex. A—Partial Statement of Laundry Operations

plies or meal service to men employed in different class gangs, therefore no intelligent comparison can be made between the two systems under consideration. It is apparent that local conditions govern the policy concerning this service, and the committee makes no recommendation at present.

There is no uniform practice with respect to furnishing supplies for this service. Where conditions are favorable, that is, where the location of the commissary with respect to wrecking outfits, is suitable, and where the commissary is in position to furnish the class of supplies used by wrecking outfits, the committee considers it advantageous to supply these outfits through commissary storerooms.

Laundries

A study was made of the operation of laundries by railroads to determine the advantages over having the work handled by commercial laundries. Questionnaires were sent to a number of railroads now operating their own laundries and information assembled shows that a material economy can be affected in expense of laundering dining car and other linen when handled in laundries operated by the railroads.

However, it would not be economical for a railroad to operate its own laundry unless there is sufficient work to keep the plant in daily operation.

A summary of the questions asked with relation to the railroad operated laundries show savings from 32 cents to $1.397 per 100 pieces. The variation is attributed to local conditions and volume of pieces. In addition, the savings in the life of the linen averages more than 25 per cent which is a very important feature in reducing the linen maintenance expense.

(A partial statement of the laundry operations is given in Exhibit A. For more detailed figures and for a record of specifications which the committee has prepared covering purchases of meat, the reader is referred to A. R. A. Circular No. D-VI-242 which also contains floor plan diagrams of laundries and commissary layouts.—Editor).

The report is signed by N. H. Mellor (chairman), commissary buyer, Pennsylvania; M. E. Bailie, assistant supply agent, Missouri Pacific; Clyde Cocke, purchasing agent, Norfolk & Western; H. A. Hansen, superintendent dining car and hotel department, Union Pacific; L. M. Jones, superintendent of sleeping and dining cars, Chicago, Milwaukee, St. Paul & Pacific; W. J. Burns, assistant purchasing agent, Canadian Pacific; C. K. Reasor, assistant manager stores, Erie; T. K. Russell, assistant superintendent dining service, Illinois Central; J. L. Bennett (chairman ex-officio), purchasing agent, Central of Georgia.

Discussion

F. D. Reed (C. R. I. & P.): The up-to-date people these days are coming to an oblong napkin, as I understand it, and our dining car department is seriously considering using a 15-in. wide by 20 to 22-in. long napkin. When you use the larger size napkin, there is so much of it you don't know what to do with. That is the reason they are coming to the oblong napkin. In the course of a year or two, that will be universally used not only in dining cars but in homes.

W. F. Jones (N. Y. C.): I made a special investigation of the small size of the napkin. In New York, there is only one firm up to this time that has adopted the 18-in. napkin; that is, the oblong napkin. The importer with whom I communicated had conferences and told me that it was the coming napkin. I told him I didn't agree with him. He said it was all right to spread

In the Tin Shop on the Union Pacific Where Old Ware Is Repaired and New Articles Are Made

a napkin across your knees but what is going to become of it when you get a man that has a corporation and wants to tuck it in? I believe the recommendation of the committee, a 20-in. by 20-in. is the proper thing.

Mr. Reed: I made that suggestion because it is not customary or proper now to stick your napkin under your collar. Just one more word. The Rock Island about three years ago built a modern, up-to-date commissary store in Chicago. I think it is one of the best I have ever seen. If anyone is figuring on building a new commissary, here is a good opportunity to see something.

Mr. Jones: The committee has recommended getting up a stock list and also a classification. I presume all railroads having dining car departments have a certain classification that they adhere to and from which they make their accounts. I believe the next committee should carefully consider that, and instead of having a separate classification, I believe we should add to our present classification. We now have 50 or 50 classifications. There is no reason why we should not add four or five more to cover the dining car department. It all belongs to the railroad. For the benefit of the committee which will be appointed, I wish they would give that proper consideration.

The Chairman: That will be referred to next year's Classification Committee. Is that your wish?

The report was adopted as rendered.

Report on Reclamation and Scrap Handling

More local work advocated——List of standard practices prepared ——Correct cost methods urged

J. C. Kirk
Chairman

During the year, a member asked that consideration be given to the selling of scrap on gross ton basis instead of net ton, due to the fact that some freight tariffs on scrap are on gross ton basis. The committee in 1926 recommended that all scrap, including rail, be sold on net ton basis. The present committee sees no reason to deviate from this recommendation, as the net ton is a goal worth working for, and it would be a step backward to consider the adoption of the gross ton as a standard. West of the Illinois-Indiana Line the tariff on scrap is on the basis of cwt. It would be better to work for a change in the tariff rather than to consider any change in the net ton for sale of scrap.

Adherence to Classification

In 1928, it was reported that of sixty-seven leading railroads of the country, thirty-seven had adopted the A. R. A. Scrap Classification as standard. Forty-three are now using A. R. A. Grading Rules. Many of the smaller lines are not using it because their tonnage is so small that they cannot profitably sort it into so many grades. Some of the larger roads not using it are located so that they must sort their scrap for local markets.

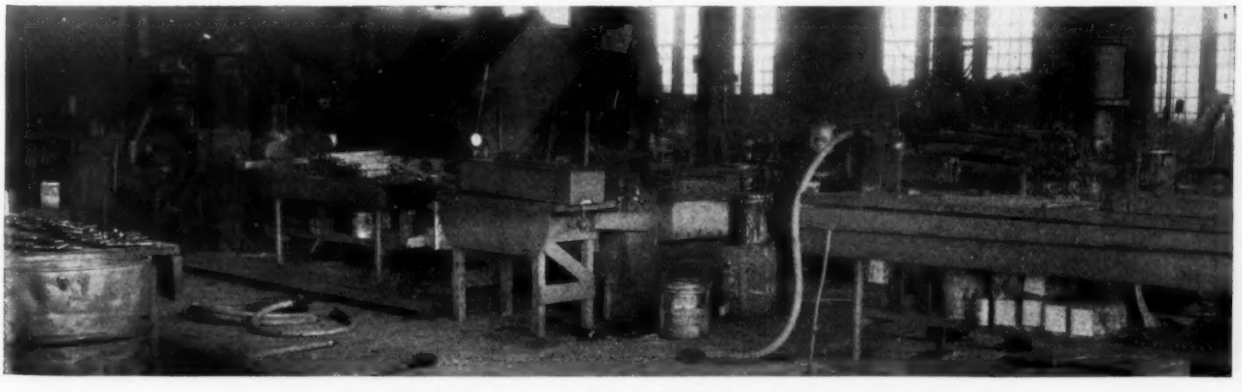
Reclamation

It is the opinion of the committee that as much reclaiming as possible should be done locally, as it avoids extra haul and returns the material more quickly to service.

The 1925 committee on this subject prepared a complete list of reclamation practices in use on the various roads, which was printed in the proceedings for that year. Since that time numerous new items have been adopted, and the list published in 1925 has been brought down to date. It should be understood that the items being reclaimed, as shown in the list, are not recommendations. They are for the information as to what other roads are doing.

In the Valve Corner of the New York Central's Reclaim Plant at Cleveland, O.

A number of roads have contracted the reclamation of oil and waste packing to outside concerns, and the work is being done



In the Hose Repair Section of the Union Pacific's Plant at Evanston, Wyo.

Straightening Track Spikes in the Rock Island's Reclamation Shop

under processes that have some features patented. Other roads are doing their own work with their own make facilities, while other roads have purchased outright the machinery and are doing the work with their own forces. Any plan of reclamation which will meet with A. R. A. specifications on the finished product will be satisfactory.

Reclaiming Crank Case Oil

The committee communicated with 114 representative railroads, and replies were received from 101. Of this number 20 had installed the apparatus for reclaiming crank case drainings from gas-electric rail cars and other types of automotive equipment. The table summarizes briefly the replies received from the different roads doing the work.

Road	Gals. Collected	Gals. Reclaimed	Percent Reclaimed	Cost of Reclaiming per Gal.	Saving
A	11,700	10,512	89.8	$ .118	$ 6,756
B	7,405	5,830	78.7	.156	3,400
C	13,159	9,260	70.3	.17	2,592
D	10,708	9,497	88.6	.084	3,472
E	34,978	21,900	68	.10	13,359
F			73.7	.397	
G	3,042	1,912	62.8	.24	
H	3,690	2,237	60	.243	
I		15,101	....	.21	
K	2,500	2,075½	83	.144	536

The table discloses quite a variation in the cost of doing the work and per cent of oil reclaimed. There are a number of factors, however, which should be taken into consideration.

Some roads are using a high grade lubricating oil, while others are using a much cheaper grade. Some roads are changing the oil in crank cases more often than on other lines, based on miles run. Most roads are using gasoline for fuel, while some are using distillate. Where the distillate is used the dilution in the crank case is a good deal heavier than with gasoline.

The canvass indicates that, the reclaimed product has lubricating qualities equal to new oil.

Accounting Methods

The committee has given considerable study during the year to ascertain if some standard method for cost accounting for reclamation plants could be recommended that would enable the various roads to compare their costs if desired, and also so that the costs shown by the railroads in their reclamation statements would be comparable to those of commercial concerns.

It will be necessary, in our opinion, to handle the accounting in connection with these plants in accordance with I. C. C. Rules and Regulations, and under these rules shop expense or overhead contain such items as supervision, supplies used, repairs to machinery, shop machinery depreciation, power, heat, etc. However, such items as accidents to employes, insurance on buildings, liability insurance, repairs to buildings and tracks used exclusively by the reclamation plant, interest on investment, etc., are not included.

In comparing costs, therefore, with manufacturers, each road should arrive at an actual percentage, which should be added when comparisons are made.

Cotton Rags and Waste

A number of roads reported the installation of machinery for the reclamation of cotton wiping rags and waste. The machinery consists of a cylindrical washing machine, extractor and drying tumbler.

The roads installing this machinery claim they are able to reclaim these items economically. One road reports the reclamation of 50,570 lbs. wiping waste during the year 1929.

Pipe Nipples

The canvass indicates that a few roads are manufacturing pipe nipples at a profit from second-hand pipe recovered from the scrap. The committee feels that wherever this work is done a very close surface inspection should be made to insure good full threads and also to be sure that pipe used is free from noticeable defects.

Journal Box Wedges

A number of roads are now reclaiming journal box wedges at a profit said to be as high as 50 per cent of the new cost. The processes used in doing this work consist of reforging and regrinding.

Journal Bearings

The committee finds the rebroaching of second-hand journal bearings is generally followed. There is no doubt but what a good many second-hand bearings can be economically reclaimed

A Lumber Yard on the Great Northern at Hillyard, Wash.

in this manner. The machine used for doing the work should be of such design that the rebroached bearing will fully meet A. R. A. specifications.

Scrap Felt

At our last annual meeting the question was raised as to disposition of old hair insulating felt removed from refrigerator cars undergoing repairs. When removed in good condition this felt can be used for packing in and around the bottom of water cans, for filling engineers' seat cushions and for insulating hatch plugs, covers and doors. For the material which can not be reused, there is a ready scrap market.

Report of Joint Committee on Reclamation

Cooperative studies of purchases and stores and mechanical divisions made———Annealing demanded

I. C. Bon
Chairman

The committee has made a careful survey of the reclamation of items of material used in the interchange of traffic. In addition to this, considerable research work has been carried on and tests made to ascertain the merits of service to be obtained from items of reclaimed material.

Brake Beams

Many of the larger railroads have installed mechanical equipment to reclaim brake beams in order to eliminate waste of material, such as brake beam parts going into the scrap. These railroads are reclaiming from 50,000 to 72,000 brake beams per annum, and with the application of reclaimed brake beams to a foreign car only a charge can be made for a second hand brake beam to the car owner. Under the A. R. A. Code of Rules this price does not fully justify the reclamation of a brake beam, of the foreign type, to the railroad reclaiming the brake beams, for the following reasons:

Railroads using channel type compression members as a standard must carry in stock additional type repair parts for brake beam compression members, angles and U, tube, solid bar, bulb and tee bar shapes.

Many railroads are not carrying the additional repair parts, and are reclaiming to extent of the accumulations of serviceable repair parts being recovered. This results in additional cost in matching up the repair parts, etc. Good parts are entering the scrap resulting in considerable waste of material.

It is recommended that every second-hand and reclaimed brake beam should be given a proof test in accordance with A. R. A. Rules regardless of whether or not it is applied to a foreign car, as an assurance of safety.

Truck Rods

The committee recommends that the Air Brake Committee be instructed to make a study covering freight car bottom truck connection rod designs, in view of developing and adopting one standard spacing of holes in connection rod jaws and a tolerance limit of wear in connection to pin holes of reclaimed or second-hand connection rods.

Welding Couplers

After a careful survey, study and inspection of coupler bodies and parts being scrapped by various railroads, it is suggested that further consideration be given to Section 2, A. R. A. Rule 23, prohibiting the welding of cracks or fractures.

The findings of the committee indicate that a greater number of couplers and parts are being scrapped each year. Owing to the present restrictions, railroads are suffering a loss in disposing of couplers as scrap in their entirety. The results of tests indicate that cracked couplers can be reclaimed by proper welding to render efficient service. The results also demonstrate the hazard of improper welding and inferior workmanship.

The shank of a coupler was welded and annealed. After annealing, no trace of any heat lines or strain was found and the microphoto of a section from the welded area indicated that the effect of welding and re-annealing had a tendency to refine the grain of the iron.

Other photos of the shank of the coupler welded but not annealed clearly outline the heat-affected area due to the weld and demonstrate conclusively the necessity of annealing after welding. Had this section been annealed, there would have been no trace from the heat set up due to the effect of the torch.

Microphotos were made of the shank of a coupler before and after welding and annealing. In the photo of the welding the heat lines clearly demonstrate the absolute necessity of proper annealing.

An examination was made of a section that was welded and annealed, and a microscopic view taken from the deposited metal as well as a section slightly affected by the heating of the weld. The pictures indicate that the deposited metal was slightly overheated. While it does not indicate the metal was burned, it clearly illustrates an excessive amount of heat.

Four couplers were prepared for testing by cutting ten inches out of the bodies, after which two of the ten-inch pieces were cut in half, the edges beveled on one end and oxy-acetylene welded, while two more pieces were cut, the edges beveled and electric welded. The tests of these pieces are given in Table I.

Table I—Test Results of Welding

		Area	Actual load Applied Ultimate	Load per Sq. In. Ultimate	Per cent Elong.	Remarks
1—Acetylene		1192	48600	40770	4.5	Broken Outside
1—Acetylene		1192	48600	40770	4.5	Broken Outside
2—Acetylene	Annealed	2364	58070	24560	8.0	Broken Inside
2—Acetylene	Annealed	2357	46130	19570	7.5	Broken Inside
3—Electric	Annealed	1743	43550	24980	3.0	Broken Inside
3—Electric	Annealed	1839	41200	22400	3.0	Broken Inside
4—Electric		2132	76290	35790	2.0	Broken Inside
4—Electric		163	62830	38550	4.0	Broken Inside

A test was made after welding a crack in a coupler guard arm shown in Fig. I with the following results:

Size: 6 in. by 8 in. A. R. A. Type D.
Length and Weight: 21 3/16 in. 260 lbs.
Drop Test:
3 blows at 3 ft. O. K.
4 blows at 5 ft. O. K.
Shank Distortion 9/16 in.
Guard Arm Opening 1/32 in.
10 blows at 5 ft. ½ in crack in guard arm at weld
12 blows at 5 ft. 5 in. crack in guard arm at weld
15 blows at 5 ft. Broken
Character of weld Good

A test was made after welding an old vertical crack through

Fig. 1—Coupler before Welding Showing Fracture which extended into Shank

Fig. 2—Coupler before Welding Showing Badly Cracked Face

the top section of the face of a coupler, shown in Fig. 2, with the following results:

Size: 6 in. by 8 in. A. R. A. Type D.
Length and Weight: 21¼ in., 269 lbs.
Drop Test:
3 blows at 3 ft. O. K.
4 blows at 3 ft. No crack at weld
Old vertical crack through top section of face was developed.
Careful inspection before annealing had not shown presence of this crack. Unable to measure guard arm opening and shank distortion.

A test was made after welding a crack in the top of a coupler shank at the back of the coupler horn with the following results:

Size: M. C. B. (Sharon) 5 in. by 7-9⅛ in.
Length and Weight: 21¼ in., 202 lbs.
Drop Test:
3 blows at 3 ft. O. K.
4 blows at 5 ft. Cracked first blow, 1¼ in. long, inside of head at lock shoulder not in weld. Cracked at second blow, 3 in. long in weld at shank back of head. Fifth blow broke off in shank back of head.
Character of Weld: Poor, crack had not been thoroughly "V'd" out.

A test was made after welding a crack through the lock lift hole and face of a coupler shown in Fig. 4, with the following results:

Size: M. C. B. (Sharon) 5 in. by 7-6½ in.
Length and Weight: 21¾ in., 204 lbs.
Drop Test:
3 blows at 3 ft. O. K.
4 blows at 5 ft. O. K.
Shank Distortion 11/16 in.
Guard Arm Opening ⅜ in.
On 12th blow at 10 ft. cracked ½ in. between shank and head.
Cracked 3 in. on 13th blow in weld.
Character of Weld: Good.

Section of Coupler showing Weld and Adjacent Heat Lines Caused by Failure to Anneal after Welding

Results of Tests

It was felt that the most satisfactory manner in which to develop the strength of the welds in the cracked couplers was by employing the old guard arm test, making the same test on a new A. R. A. and new M. C. B. coupler. It will be noted that couplers No. 1 and No. 4 which were badly cracked in the face gave good results on the drop test. Coupler No. 2 which was expected to give a good test account of the location of the weld developed an old defect which was almost impossible to discover on inspection. Otherwise this coupler would no doubt have passed the drop test. Coupler No. 3 demonstrates the danger in improperly making these repairs. The crack had not been thoroughly "V'd" out so that a very weak weld resulted which caused failure of the coupler in the drop test. The Joint Committee recommends that Rule 23 be modified to permit autogenous welding of couplers and parts under the proper safeguard to insure first-class workmanship of welding and normalizing.

Angle and Cut Out Cocks

Careful inspection and tests of reclaimed or repaired angle and cut-out cocks on various railroads, and in the application and removal of them in train yards have been made. The Joint Committee recommends that the use of standard pipe bushings be prohibited as a matter of safety and expense and that face bushings only be used.

Fig. 4—Coupler before Welding Showing Crack through Lock Lift Hole and Face

Air and Signal Hose

The committee found in its inspection a number of new hose sections to which second hand couplings and nipples had been applied. The couplings had excessive worn guide pins; and in some instances were very rusty. The nipples had distorted threads. From all indications of wear and other conditions second hand fittings are more or less being applied without careful inspection, gaging and testing, resulting in waste of new hose sections. One thing in particular was quite noticeable, that is, the application of nipples without cleaning the threads and applying of rust preventive.

Knuckle Pins and Tolerance

The committee has made a survey and inspection of coupler knuckle pivot pins and finds that the majority of railroads are not using any condemning tolerance. The committee recommends that the Coupler Committee be instructed to make a study covering reclaimed and second-hand coupler knuckle pivot pins, and develop a condemning tolerance.

Helical Springs

The committee found a large number of helical springs in the scrap, which indicated a considerable waste of this material. From all indications quality or design seemed to be the direct cause for scrapping. A number of railroads have installed mechanical equipment for the reclamation of these springs. The equipment consists of oil furnaces, with pyrometer heat control, oil quenching, salt baths, special designed bull dozers for spreading coils to the desired dimensions and hydraulic test machines. This work has not progressed sufficiently to report on the merits of the reclamation practice.

Identification of Material

The committee has found on a number of railroads that reclaimed and second-hand material carrying a second-hand price is being painted to prevent its application to foreign equipment and the rendering of bills for new material. The following is offered as a standard mark of identification:

A three-quarter inch dot with stenciling brush to be applied with yellow paint on all items of reclaimed material, and a white dot of the same diameter on second-hand material.

Building Up Worn Collars

The committee has found a large number of railroads scrapping car axles due to thin collars, and only a small per cent of railroads reclaiming them by the process referred to above. The committee recommends that the Wheel and Axle Committee be instructed to make a study of this practice, and set up a standard rule for building up the collars on axles. It is the opinion of your committee that large savings can be made if these axles are reclaimed properly. This also applies to the up-setting of car axle journals.

It is the opinion that a Manual of Standard Reclamation Practices and Rules should be compiled for the guidance of railroads and that the committee serve indefinitely as a regular committee, until a manual of rules and regulations governing methods of reclamation and tolerances allowed on reclaimed material be agreed upon.

The report is signed for Division VI by I. C. Bon (chairman), superintendent of reclamation, Wabash; G. W. Lieber, superintendent of reclamation, Missouri-Kansas-Texas; A. L. Prentice, supervisor of scrap & reclamation, New York Central Lines; W. P. Stewart, superintendent of scrap, Illinois Central; and for Division V by J. W. Bukey, foreman reclamation plant, Pennsylvania Railroad; G. H. Gjertsen, master welder, Northern Pacific; L. R. Wink, asst. superintendent car dept., Chicago & North-Western.

Discussion

The Chairman: You have heard the report on Reclamation and the Joint Reclamation report. This subject is now open for discussion and questions.

C. W. Baldwin (Bangor & Aroostook): I would like to ask the committee for information about selling scrap on a net ton basis. There seems to be a good deal of confusion, in the east, at least, on this question. I have talked with a prominent scrap dealer in New York, and he says that half the railroads ask for a price on a gross ton basis and half on a net ton basis. It creates a good deal of confusion, because the freight rates to the mills are all on a gross ton basis and most of the trade publications quote prices on a gross ton basis. It seems to me it makes more work for all of us. We do not get a higher price, because we can't fool the scrap dealers.

Chairman J. C. Kirk (C. R. I. & P.): As far as we have been able to develop, it is the practice on all western roads, at least, to sell scrap on a net ton basis. It is the practice also on the western roads to have the freight rates on a hundred weight basis. This subject has been considered two or three times. This is the day when we are trying to get things simpler. We are spending a large amount of money on such things as metric systems and various things of that kind. I don't think there is any question but what the net ton basis is much simpler than the gross ton basis, provided we can get it uniformly adopted. We have made a start, at least. We have the west in line, and perhaps if we could get the eastern tariffs in line we could follow our recommendations uniformly all the way through.

It is the recommendation of the committee that no change be made in the net ton basis, which was adopted at the 1926 convention.

Mr. Baldwin (Bangor & Aroostook): Can we have a show of hands as to how many railroads are using the gross ton basis and how many are using the net ton basis?

H. H. Laughton (Sou.): We adopted the net ton basis some years ago. We dispose of approximately 50,000 tons of scrap. We don't have any difficulty in arriving at the price and meeting the dealers in their quotations. We use a celluloid table, which shows the net ton, the gross ton, and the prices. We wouldn't go back to the gross ton even if this convention changed the plan.

The Vice Chairman: The count shows 29 roads using a net-ton basis as against 17 on a gross-ton basis.

The Vice Chairman: Will the representatives of railroads who are selling on either a net or gross ton basis please rise? The Wabash is the only one.

F. D. Reed (C. R. I. & P.): We sell our scrap on the basis of net ton. When we frequently get quotations from scrap dealers on gross ton basis, we immediately reduce it to the net ton basis and accept it on that basis. I think all the rest do the same thing.

E. A. Clifford (C. & N. W.): There is an exception to be noted. All of the buyers buy certain kinds of scrap on a gross ton basis, and other scrap on a net ton basis.

B. B. Melgaard (C. M. & St. P. & P.): We insist on all scrap being sold on a net ton basis.

A. L. Sorensen (Erie): May I ask if that has always been sold on a hundred-pound basis?

Chairman Kirk: As far as I know, it has for a good many years.

C. H. Murrin (I. C.): In reading over and comparing the report of the joint committee with the report of the committee proper, I wonder if there is a conflict on the building up of journal collars. This is recommended as a standard practice.

Mr. Kirk: I think you are referring to the Appendix. That isn't a standard practice. That is simply a compilation of recommended practices that are in effect on some railroads. If you will read the report, you will find that we specifically state that those things were not the recommendations of the committee. They were simply practices of some roads.

C. K. Reasor (Erie): The committee gives the per cent of oil reclaimed. Is there any information as to the per cent of old oil turned back and new oil applied?

Mr. Kirk: No.

C. W. Peterson (Bangor & Aroostook): Relative to using old oil drums as trash burners. As chairman of the Committee on Fire Prevention, I desire to call attention to the fact that at the San Francisco convention last year we accepted a report from the Railway Fire Prevention Association which reads as follows: "Incinerators of substantial construction and design should be used for the disposal of all flammable rubbish." It does not seem to me that an old barrel, which is not even fit for water, would come under that classification.

Mr. Kirk: That isn't a recommendation of the committee. It simply is a practice that is being followed and was reported to us. However, in a small way, I don't see any objection to using a one-time container for an incinerator, especially at a small station where they just have a little waste paper to burn up.

L. F. Duvall (A. C. L.): Those roads that haven't tried out the reclamation of waste will find a great saving in following the committee's suggestion. In one of our shops we undertook this ourselves. We found out it entailed quite a considerable outlay. We interested a laundry and finally contracted with it to do this work for us. It called and got the waste, washed it, dried it and brought it back to us, at a considerably lower cost than it saw possible to buy it from the manufacturer. We are using an ordinary soap for this cleaning work.

Mr. Clifford: I would like to ask if the committee's statements about rubber are recommendations?

Mr. Kirk: We do not recommend that any railroad go into the reclaiming of rubber. Our investigation developed that it requires quite a good deal of money.

We simply furnish the information to show you what is being done in the country in the reclamation of rubber and the development of it. There are two or three plants that are gradually getting to it. Sooner or later we may be able to get a little better price for scrap rubber.

The motion to accept the reports was carried without further discussion.

Report on Terminal Railway Storekeeping

Better methods and facilities needed to correct conditions——
Owning lines overlooking problem.

J. C. Dods
Chairman

It is the desire of the committee to direct attention again to last year's report and urge that the recommendations be given more consideration by purchase and stores officers of the trunk lines. It is evident from further study by the committee that the desired results have not been obtained on some of the properties. Where the recommendations have been carried out, improved conditions with reduced stock investments have resulted.

Emphasis should be placed on the following recommended practices in the interest of improving terminal railway stores' methods:

Control of Stocks

All material requisitioned from proprietary companies should be invoiced and carried in the stock balance of the terminal company; and the practice of requiring terminal properties to carry materials belonging to the proprietary companies should be discontinued.

Where the stocks are used by two or more companies such stocks should be procured in the manner most advantageous to the terminal company.

Consideration should be given by terminal stores to the adoption of plans profitably followed and recommended by Division VI of delivering material from stores direct to users.

It is further recommended that consideration be given to the methods of unit pricing, or placing prices directly on the material.

All unapplied stocks of material should be in store stock balances and directly under the control of stores' supervision until actually applied. Some terminal companies allow their operating departments to carry or control their own stocks.

Surplus Material

It should be the privilege of a terminal company to return to the proprietary line at any time materials procured from that line for the protection of the owners' equipment and to invoice it at the price paid, providing it is in the same condition as when received.

Terminal line companies should give consideration to the reclamation of scrap and recovered material, and as far as profitable the practices outlined in the recommendations of Division VI should be followed.

Terminal lines purchase and stores officers should direct the attention of their managements to the importance of good facilities and improved material handling appliances to reduce handling costs. Improved methods of storage, handling and care of material reduce operation costs and stock investments.

As the terminal railways are an important connecting link of the trunk line railways, so the material handling problems of the terminal companies are important to the purchase and stores officers of the trunk lines, and it is urged that these officers interest themselves in the material problems of the terminal companies for the benefit of both properties.

The report is signed by: J. C. Dods (chairman), general storekeeper, Kansas City Terminal; W. R. Culiver, general storekeeper, Pere Marquette; W. W. Davis, purchasing agent and storekeeper, Atchison, Topeka & Santa Fe; J. T. O'Dea, assistant to president and purchasing agent, Peoria & Pekin Union; E. H. Polk, district storekeeper, Southern Pacific; H. A. Smith, purchasing agent, Terminal Railroad Association of St. Louis; C. E. Swanson, storekeeper, Chicago, Burlington & Quincy; C. W. Yeamans, purchasing agent, Chicago & Western Indiana; H. J. Zimmerman, storekeeper, Pennsylvania; H. C. Stevens (chairman ex-officio), general storekeeper, Wabash.

Discussion

[*The report was presented by C. W. Yeamans (C. W. I.) in the absence of the chairman and the motion was made to accept it.*]

U. K. Hall (U. P.): Suppose one of the other tenant lines take material from the terminal company? Has the committee investigated or recommended, at what price that should be billed? Road A may sell something to the terminal company and it becomes surplus. Road B can take it back. Will road B pay the price that they can buy the material for at the time or will road B bill it?

Mr. Yeamans: That did not come up in the committee, that I remember. I can speak from experience, though, that in certain common materials that we bought in the market, we have made concessions to meet present market prices, and conditions. Materials purchased from road A, as you designate them, would in most cases be returned to road A and road B would not be asked to take them off our hands.

The report was accepted without further discussion.

The reports of the committees on Resolutions and Nominations were then presented and the elction of officers announced whereupon the convention was adjourned sine die with the following remarks in closing by the retiring chairman:

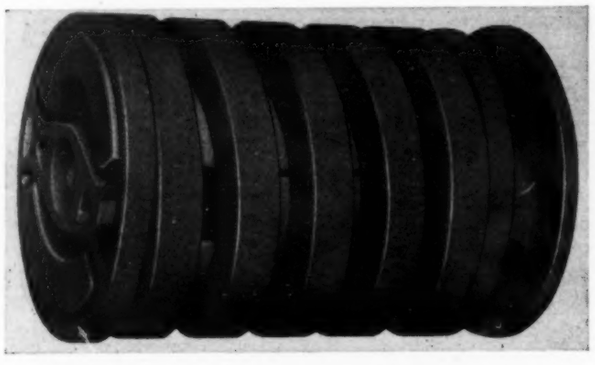
Post-Chairman Davidson: I am closing a very pleasant year. It was not my intention to make further remarks after my address, but the support that I have received from members and officers at this meeting is very much appreciated. Your attendance, your attention and constant listening to reports, indicates the interest that you were sent down here to perform.

In the New Santa Fe Store at Amarillo, Tex.

New Devices

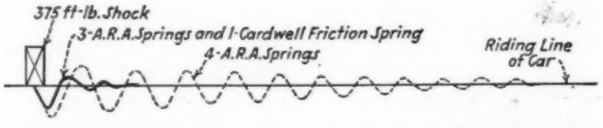
Cardwell Bolster Spring

THE Cardwell Westinghouse Company, Chicago, is exhibiting at its booth a friction bolster spring designed to improve the riding qualities for loaded as well as light cars. The application of the spring is made by removing one of the A. R. A. bolster springs and replacing it with the Cardwell friction bolster spring, the unit fitting in the same space occupied by the



Cardwell-Westinghouse Bolster Spring

A. R. A. standard coil. The spring is 5 7/16 in. in diameter, has a free height of 8¼ in., a solid height of 6⅝ in. and a travel of 1⅝ in. It has a 54,000-lb. resistance and 38,000-lb. recoil capacity. All wearing parts of the spring are made of hardened alloy steel and has a limited



Comparative Bolster Movement of a Set of Four A. R. A. Springs and a Set of Three A. R. A. Springs and One Cardwell Spring

travel, which prevents the A. R. A. coils from being driven solid. In one of the illustrations is shown a comparison of the bolster movements of a set of four A. R. A. springs and a set of three A. R. A. springs and one Cardwell spring taken from actual tests.

Shafer Self-Alining Roller Bearing

THE Shafer Bearing Corporation, Chicago, is exhibiting a complete line of self-alining roller bearings as applied on steam locomotives and tenders, electric locomotives, passenger and freight cars, and also as used for general industrial purposes. In the exhibit is a full sized section showing the mounting of this bearing in an American Steel Foundries roller-bearing unit designed for application in standard A. R. A. trucks.

Shafer Self-Aligning Roller Bearing With Outer Race Removed to Show Shape of Rollers

The Shafer self-alining bearing consists of a single unit with inner and outer races, or cup and cone, each of which has a spherical bearing surface. When assembled, the concave rollers are held in a spacing retainer and placed at an angle between the inner and outer races so that the curved surfaces provide the automatic self-alining feature. A single set of rollers takes care of both radial and thrust loads. Shocks or misalining in operation do not affect the free-rolling action of the bearing even under heavy loads.

The cup and cone are made of low-carbon nickel-molybdenum steel, heat treated and hardened. The rollers are of chrome-nickel molybdenum steel of medium carbon content that does not require carburizing.

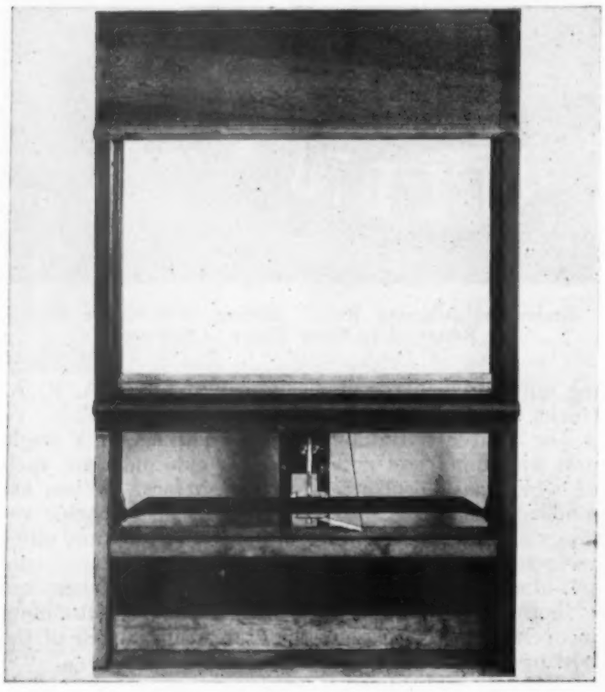
Brake Equipment for Self-Propelled Rail Cars

THE Westinghouse Air Brake Company, Wilmerding, Pa., has developed a new brake equipment to meet the needs of modern self-propelled rail cars, which are heavy, long, and often double ended. A complete operative equipment is on display among that company's exhibits.

It possesses the operating advantages of the standard No. 6-ET equipment, and brake-valve manipulation is the same. Among the distinctive features are provisions for properly timing independent application and release regardless of vehicle length; means to insure the same rate and degree of automatic application as with the standard ET equipment, even on very long cars; protection against loss of brake-cylinder pressure if pipes are ruptured in collision; and a safety feature, or "dead man's" protection, which causes an automatic emergency brake application and shuts off the power, if the operator becomes incapacitated while the car is in motion.

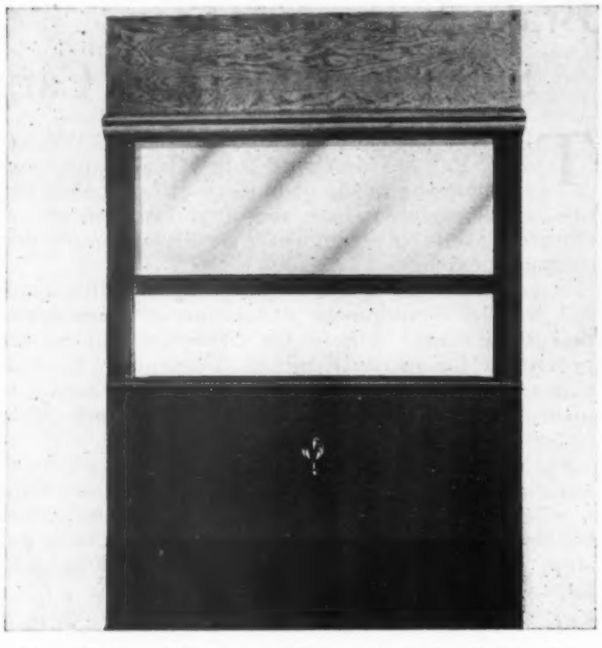
Briggs & Stratton Window Lifters

THE Briggs & Stratton Corporation, Milwaukee, Wis., has on exhibit a window lifter for railway coaches. It opens and closes the windows of the



The Operating Mechanism of the Lifter

railway coach on a principle similar to that used for window lifters in motor cars. It may be used with either



The Window Lifter Is Similar to That of a Motor Car

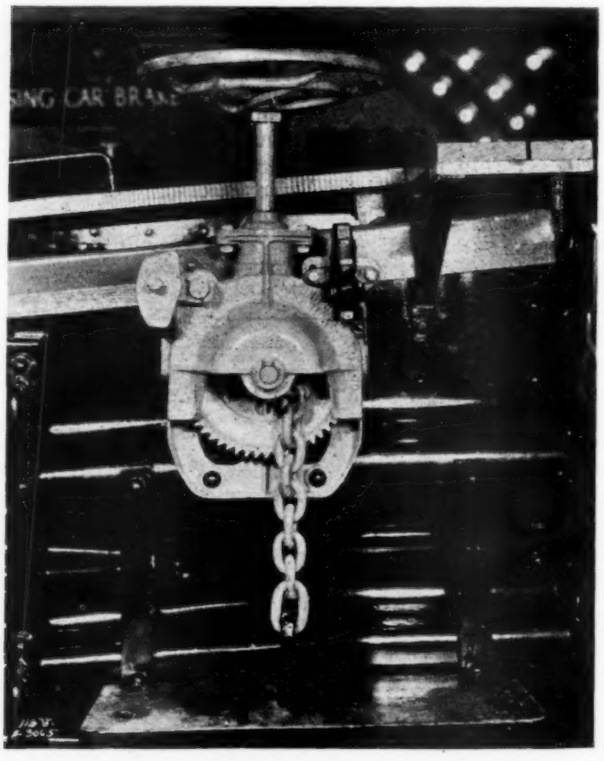
single or double windows, having a glass travel of about 9 in. However, equipment which will permit greater range can be furnished.

The glass is mounted on two vertical bars and a horizontal bottom-bar to which is attached the rack of the lifting mechanism. The rack, either hinged or rigid, is operated through a pinion that is rotated by the hand crank. A compensating spring is part of the pinion or hub assembly, offsetting the weight of the glass.

Although the lifter is equipped with a crank handle, the company furnishes only the other window-lifting equipment, including the rack, pinion and hub assembly cut to accommodate the handle. The frames for the glass and felt channels are supplied by the car builder.

Klasing Hand Brake

THE Klasing Car Brake Company, Chicago, is exhibiting three types of hand brakes which, while not differing in general principle from the original design, now embody a number of improvements in details and, in the three forms available, are adapted for various kinds of freight-car equipment. The original design was of the horizontal-wheel type. This has been



Klasing Safety Hand Brake, Horizontal Wheel Type

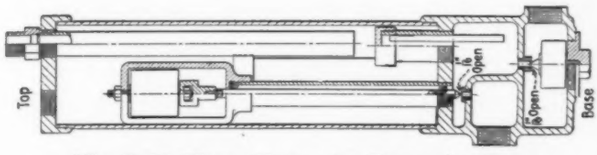
redesigned, and embodied in the frame is a bracket for the pressure-retaining valve. It is fitted with a non-club hand wheel and can be operated easily from the top of the car without the use of the step. Other designs are of the vertical wheel type and short-lever type, making them suitable for application on the end or side of the car. With any type—wheel or short-lever—a pull on the brake rigging in excess of that developed by

the air brake is readily obtained. The set and release device is located on top of the mechanism housing.

In addition to the exhibit in the hall, there is a demonstration car on the tracks at the Reading Terminal.

A Water Heater for Passenger Cars

THE Gold Car Heating & Lighting Company, Brooklyn, N. Y., has included in its exhibit a water heater for passenger cars. The heater, designed to supply water at a predetermined temperature for wash basins, may be placed either beneath the car or inside the car.



The Gold Water Heater for Passenger Cars

Steam enters at the base of the heater and passes through heater tubes which are surrounded by water. The water enters at the top of the heater and is discharged at the bottom. The temperature of the water is controlled by a bellows-type steam valve which is contained within the heater. This valve is adjusted to supply water at any desired temperature in sufficient quantities for one or more basins.

The Elwell-Parker Heavy Duty Crane

THE Elwell-Parker Electric Company, Cleveland, Ohio, is exhibiting a heavy duty crane designed for railway shop and enginehouse use. This machine has a lifting capacity of 42,000 ft.-lb. or 6,000 lb. at a seven-foot outreach, the outreach being measured from the center line of the crane column to the center line of the hook.

This Crane Has a Capacity of 6,000 Lb. and a Speed of 5 Miles Per Hour

A Rear View of the Crane Showing the Controls

The machine obtains its power from storage batteries or from a gasoline-driven generator which is located on a deck which supports the counterweight for the load, the batteries or gas unit also serving as a part of the counterweight.

The heavy duty direct-current motors are Elwell-Parker built and do not have protecting devices such as fuses or circuit breakers to prevent extra high surges of power from being applied, as these motors are said to take the battery output without harm for occasional demands. Three motors are used on the crane, one for the crane travel, one for the hook and boom motions and one for slewing the boom. The motor for raising and lowering the hook as well as the boom operates two winding drums through worm-gear reductions. The power is transferred from one drum to the other by a positive clutch which the operator controls from his driving position. Each drum has a contracting brake which is simultaneously released or applied with the shifting of the clutch so that there can be no dropping of the load or boom. A third brake is applied to the electric motor to absorb the armature momentum, which brake is also automatically applied by a solenoid which releases or sets the brake when power is applied or cut off from the motor.

The slewing motor drives through a gear reduction by means of friction discs on the worm wheel which take care of possible damage to the boom or load in case the boom encounters an immovable object. The motor, in this case, turns over without harm, merely slipping two steel discs in an oil bath over a bronze face. The operator need not step from his position on the pedals to complete any movement of the boom or hook for the controllers are within easy reach and one pedal takes care of the brake. The clutch for the hoist unit is also conveniently located on the dash.

All motors are made as fool-proof as possible, the controllers having self-returning handles, brakes being automatically applied and a limit switch set to cut out the hoist motor when the boom is raised to a vertical position. In order to move the crane truck, the operator must be standing in a position to be able to throw in the reversing switch and if he should step from the machine, even though it is being driven ahead, it will stop within its length.

The independent brake and power control allows for safe starting on inclines as the power can be applied to the motor even though the brakes are set, then by gradually releasing the brake, the truck picks up speed without the familiar slipping back.

The capacity of the machine, as previously stated, is three tons at a 7-ft. radius. It has a speed of 3 1/2 to 5 m. p. h. with three travel speeds in either direction. The hoisting speed is 10 to 15 ft. per min. and the slewing limit is 205 deg. in 15 seconds. These speeds are dependent somewhat upon the battery selected for use with the machine. The over-all width of the crane is 60 ft. and it has a length of 120 in. with the boom raised and the pedals folded up. The booms are telescoping with lengths from 8 to 19 ft. in 12-in. settings.

The crane has a two-wheel drive, the motors being directly connected to worm gearing. There is a single motor driving and double-drum hoist. A four-part 3/8-in. cable is used to the end of the boom with a three-part line to the boom. The hoist and boom is controlled by a drum shift clutch which is hand-operated while the disengaged drum is automatically locked.

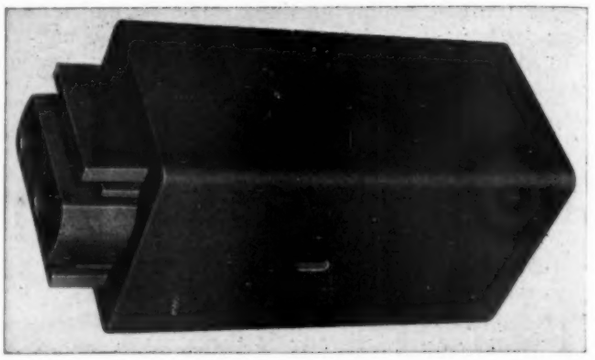
The battery compartment is built to accommodate 16 cells of a 21 to 27-plate Exide Iron-Clad battery, or 30 cells of Edison A-8 or A-10 battery. The operating range on these batteries is from 12 to 20 miles. The weight of the crane, with the average size battery, is 10,000 lb.

This machine has sufficient capacity for handling car wheels and axles in and out of gondola cars, being able to lift wheels or axles from the side of the crane as well as over the end. This crane is said to have sufficiently greater capacity to allow a 66 per cent greater lift than on the earlier type electric cranes manufactured by this company.

The Cardwell Type NZ-11-D Draft Gear

THE Cardwell-Westinghouse Company, Chicago, is exhibiting its type NZ-11-D draft gear in which there have been changes made in the construction and frictional relation among the operating parts. The side wedges are now of tempered steel and the removable friction plates are made heavier and of hardened steel, with stationary friction plates of alloy steel. The gear is 20⅛ in. long, 9½ in. wide, 9 in. high and has a maximum travel of 2¾ in. Uniform gear operation is accomplished by a wedging system through the action of side wedges, which adjust themselves to variations in alinement of any part of the gear.

The first movement of the gear is confined to the center wedging system acting against the spring and laterally against the friction plates. As the travel increases the follower plate contacts with the outer ends of the movable friction plates, causing them to be forced inward against the high frictional resistance of the plates and springs. The release of the gear is made positive



The Cardwell Westinghouse Redesigned Friction Draft Gear

by the springs acting directly on the center wedging system, reducing the wedging action between the friction plates and permitting the spring plate to operate against the inner ends of the movable friction plates, forcing them to their full release position.

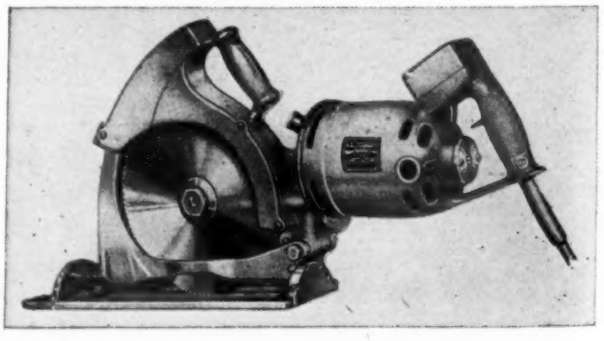
The gear may be assembled and disassembled without removing bolts or keys. The gear housing is a heavy annealed steel casting and is not subject to friction wear.

Double-Lug Brake Shoe

A BRAKE shoe designed with a double key lug instead of a single key lug is being shown at booths of the American Brake Shoe and Foundry Company, New York. The purpose of this shoe is to provide greater bearing area between the brake shoe and brake head. Since on the present standard single-lug brake shoe the brake heads are subject to wear on the lower side of the center pocket and the upper end stops the two-lug brake shoe with its additional bearing area is designed to increase the serviceable life of brake heads.

Stanley Safety Saws

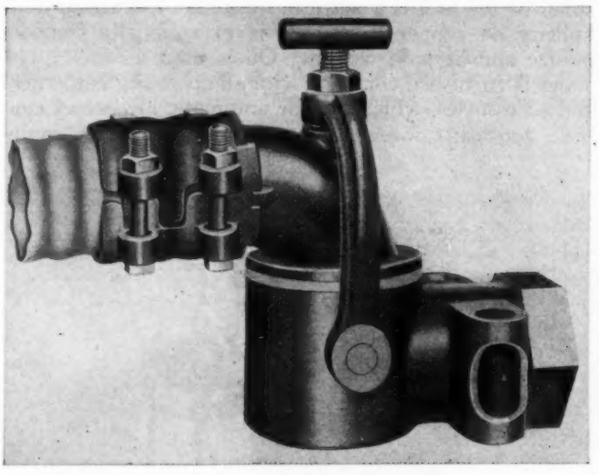
THE electric saw shown in the illustration is being included in the exhibit of the Stanley Electric Tool Company, New Britain, Conn. The saw is equipped with a patented safety feature which guards the blade at all times. Power from an air motor is delivered to the blade by spur and bevel gears. The saw can be furnished in four different sizes, ranging from one with a 7-in. blade to one with a 16-in. blade, with cutting depth capacities ranging from 2 in. to 6 in.



The Stanley Safety Saw

The T-Z Tender-Hose Coupler and Strainer

THE T-Z Railway Equipment Company, 14 East Jackson boulevard, Chicago, has in its exhibit a tender-hose coupler and strainer for locomotives made of two main parts held together by a yoke and T-bolt. They are arranged so that the hose end may be rotated within certain limits to avoid kinking of the hose when the engine and tender connections get out of alinement. The strainer can be removed, cleaned and replaced by loosening the T-bolt, dropping the yoke to one side and lifting off the hose end.



The T-Z Tender-Hose Coupler and Strainer

Six sizes of these units are available for various size piping or tender hose used. The strainers in all sizes have a capacity of more than three times the volume of the feed pipe and are made from heavy sheet copper in order to hold their shape. There is a removable plug in the bottom of the coupler to drain the lowest point. Clamps are provided to conform to the corrugations on the hose end to prevent the possibility of hose pulling or blowing off. The two main parts are sealed with a rubber gasket made to resist the action of steam and water.

Nitrided Forgings

THE Camden Forge Company, Camden, New Jersey, is exhibiting nitrided steel locomotive forgings, such as crank pins, crosshead guides, links and other revolving and reciprocating forgings which are subject to surface wear. The forgings have great surface hardness and in regular commercial production they test between 900 and 1,100 Brinell.

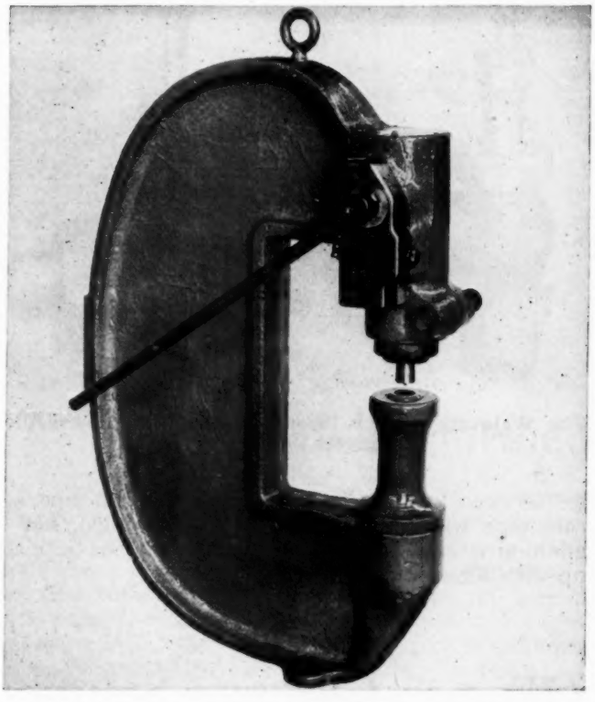
Nitrided steel forgings are made from an alloy steel which is forged, heat treated and finish machined before nitriding. Maximum physical properties of the steel show a yield point of 180,000 lb., tensile strength of 225,000 lb., elongation of 10 per cent and reduction of area of 35 per cent. Brinell hardness before nitriding runs around 445.

The nitriding action takes place when the finished forgings are placed in a sealed container which is run into the furnace and ammonia gas is released into the box under pressure. The furnace is slowly brought up to the desired temperature of between 950 deg. and 1,000 deg. F. The nitriding action is produced by the disassociation of the atoms of nitrogen and hydrogen in the ammonia gas, which penetrate the surface of the steel, the depth depending on the length of time during which the parts are subject to the nitriding action. This period varies from 15 hours to 90 hours, and the maximum depth of the hardening is .031 in. The nitrided case is unfirmly distributed and backed up by a ductile core. There is no sharp line of demarcation between the case and the core, the transition being gradual.

Hydraulic Web Punch

THE hydraulic web punch, exhibited by Messinger Bearings, Inc., Philadelphia, Pa., is a unitary structure containing all the working parts. It consists of two main parts, the pump and the yoke. All the working parts are removable and interchangeable on all hydraulic tools manufactured by this company. The punch is designed with a system of valves whereby a unit pressure of 30,000 lb. per sq. in. can be developed and maintained.

The use of a special high-strength steel for the cylinder, which feature, coupled with the high unit working pressure, permits light construction of the tool. The pressure medium is oil which lubricates all the working parts. The device will pierce a hole 1-1/16 in. in diameter through 1-in. plate by applying 110-lb. pressure at the end of the 30-in. pump handle. With each stroke of the handle the ram travels approximately 1/32 in.



The Messinger Portable Hydraulic Web Punch

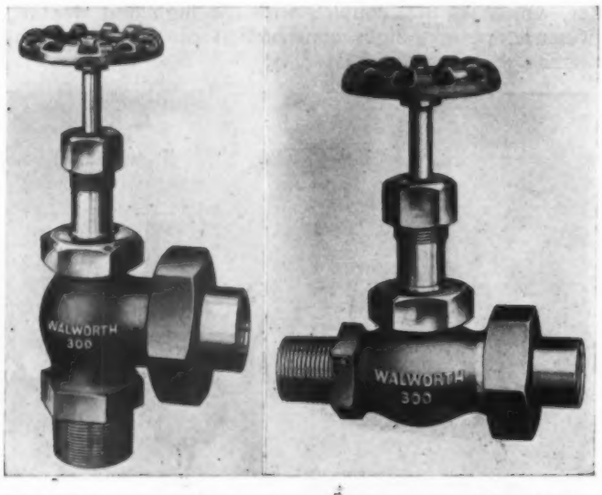
Walworth Pipe and Valves

THE exhibit of the Walworth Company, Boston, Mass., includes a line of 300-lb. locomotive valves and the Walworth chrome-nickel-iron pipe. The locomotive valves are of bronze with a nickel-alloy seat and disc, or with bronze seat and disc. They are made up with union connections and are especially designed for close-quarter work in locomotive cabs.

Walworth chrome-nickel-iron pipe is offered as an answer to corrosion problems encountered in buried lines in railroad yards and along railroad rights-of-way

Walworth C. N. I. Pipe Showing a Beveled End for Welding, a Grooved End for Victaulic Coupling and a Threaded End

and is designed for steam, air, water and drainage lines. This pipe can be made with beveled end for welding, grooved end for victaulic coupling, and threaded end



The Walworth 300 Lb. Bronze Valves with Nickel-Alloy Seats and Discs

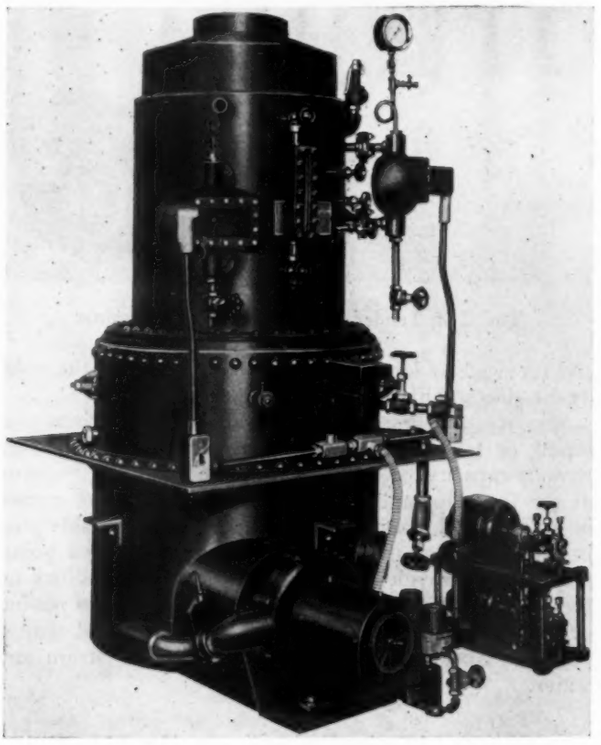
for screwed fitting. The chrome-nickel-iron pipe is a cast pipe with the virtues of cast-iron pipe, but in addition is easily cut and threaded and can be made up with screwed fittings.

Okemco Cleaning Solution

THE Oakite Products, Inc., New York, is displaying a method whereby air compressors can be cleaned without dismantling. A large operating model of a compressor, in which the interiors of several passages and chambers are exposed, shows the circulation and action of vaporized solutions of Okemco, the material used for this purpose. Stripping paint from locomotive tenders by the solution flow-on method of applying Oakite material, will also be demonstrated.

Steam Generating Unit for Gas-Electric Cars

A STEAM generating unit for gas-electric cars and electric locomotives is among the exhibits of the Vapor Car Heating Company, Inc., Chicago. The boiler of the unit is a vertical, fire-tube type with a multiplicity of copper tubes. It is exceptionally compact in size and light in weight. Oil is used as fuel. The boiler is furnished complete with all operating equipment and accessories, which include automatic low-water control, automatic water-level control, oil-burner equip-



The Vapor Steam-Generating Unit for Gas Electric Cars and Electric Locomotives

ment, two feedwater pumps, reflex water-gage, automatic pressure-control switch, steam-pressure gage, two safety valves, blow-off valve, two horizontal check-valves, globe valve, three compression gage-cocks, one stop valve, one reducing valve and one steam gage.

In case of low-water in the boiler, the oil burner is automatically shut off entirely. In fact, in case of failure of any part, the entire unit is automatically cut out and cannot be started until the trouble has been corrected. An electric pilot signal is lighted in the driver's compartment at all times while the oil burner is in operation. When the oil burner shuts off entirely, the signal light is extinguished.